THE UNIVERSITY OF ALBERTA

INFORMATION PREFERENCE DURING SENSORY DEPRIVATION

by

LAWRENCE WILLIAM MACNEIL

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE

DEGREE OF

MASTER OF ARTS

DEPARTMENT OF PSYCHOLOGY

EDMONTON, ALBERTA

Spring, 1969

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "Information Preference During Sensory Deprivation" submitted by Lawrence William MacNeil in partial fulfillment of the requirements for the degree of Master of Arts.

ABSTRACT

The purpose of this study was to investigate information preference during sensory deprivation (SD) for persons varying in conceptual complexity. The hypotheses advanced were extensions of the Harvey et al. (1961) and Schroder et al. formulations of the personality variable, conceptual complexity. One hypothesis was that persons low in conceptual complexity would request more information during SD than persons high in conceptual complexity. The other hypothesis was that during SD persons high in conceptual complexity would prefer the more complex information, while persons low in conceptual complexity would prefer the less complex information.

A 2 x 2 x 2 x 8 repeated measurement analysis of variance design was employed. There were two levels of conceptual complexity, persons high and persons low in conceptual complexity; two levels of information complexity, a complex and a simple message, and eight levels of time, the number of half hour periods comprising the duration of the experiment.. Conceptual and environmental complexity were between Ss while information complexity and time were within.

In the SD condition Ss sat upright on a bed, and wore armbands, and translucent goggles. The room, 8' x 10' was illuminated, but windowless.

On either side of the S switches were placed, corresponding (randomly for each S) to the complex and simple message. The S was instructed to press a switch whenever he wished to hear one of the messages. In the Non-SD condition Ss were free to walk around the room which was 9' x 11' and contained a large window overlooking the surrounding university area. As in the SD condition, there were two switches. The Ss could also read magazines, play cards, write on a blackboard, and/or play with a "tinker toy".

Both hypotheses received support from the data. As expected, no significant differences were found in the control, Non-SD, , condition.

ACKNOWLEDGMENTS

I am honored to express appreciation to all those who have made the completion of this thesis a reality. I particularly wish to thank Dr. Brendan Rule, whose tutorship was considerable and gratefully received.

I also wish to thank Drs. N. Ginsburg and T. Harvey for serving on my committee and for their constructive comments and criticisms.

Lawrence William MacNeil

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

During the past fifteen years in psychology considerable theory and research have been directed to the area of activation. The neuropsychological dimensions of activation has been delineated by Malmo (1959). He considered activation to be:

> ...."The continuum extending from deep sleep at the low activation end to "excited" states at the high activation end which is a function of the amount of cortical bombardment by the ascending reticular activating system, such that the greater the cortical bombardment the higher the activation. (p. 384)."

The main postulate of this area is that certain behaviours will be differentially affected by the organism's level of activation. Theories of activation have attempted to integrate behaviour and activation.

Within the perspective of activation there have been many and diverse theoretical formulations. However, one pivotal hypothesis has generally been accepted. This is the inverted U hypothesis. This hypothesis states that there is a certain optimal level of activation for the performance, acquisition, etc. of a particular behaviour. A level of activation below or above this optimal leval results in a decrement in the quality of the behaviour.

Although couched within the activation context, the behavioural and activation indices related in the inverted U function have varied.

For example, Harvey, Hunt & Schroder (1961) measured activation environmentally, and used cognitive structure as the behavioral index. (They postulated that an optimal level of environmental complexity produced an optimal level of cognitive functioning). In a further interpretation of Harvey, Hunt & Schroder's (1967) work, Schroder, Driver and Streufert (1967) replaced environmental complexity, and cognitive functioning by information complexity and information processing, respectively. Schroder, et al., (1967) also assumed that a certain optimal level of environmental complexity produced an optimal level of information processing.

A person's level of information processing is dependent on the complexity of his integrative ability, i.e., the ability to interconnect, or relate stimuli. Persons differing in integrative ability not only process information differently, but also have different optimal levels of information processing and environmental complexity (Schroder, Driver and Streufert, 1967).

Schroder, et al., (1967) also posited differential levels of information processing and environmental complexity above or below the optimal level for persons varying in integrative ability. The purpose of the present study was to investigate whether or not there were any information preferences during a suboptimal level of information complexity for persons varying in conceptual structure.

The remainder of the introduction will present the rationale for the expected differences during sensory deprivation for persons varying in integrative ability when information complexity is the dependent variable. Four areas will be examined; first, the inverted U hypothesis, second, research which has been directed to examining behaviour differences in persons varying in integrative ability, third, research which has specifically been addressed to the behaviour differences during SD for persons varying in integrative ability, fourth, research which has demonstrated SD as a crucial environmental manipulation producing information request, and finally, the problem.

As previously stated, the inverted U hypothesis posits a certain range of activation, arousal, and environmental complexity, which produces optimal performance, pleasure, and information processing. Divergence from this optimum produces a drive to, in some way, regain that optimal level. Summaries of the literature concerned with this hypothesis have been published by Millar (1960), Fiske & Maddi (1961), Harvey, Hunt & Schroder (1961), Suedfeld (1963), and Hunt (1963).

There have been variations in the exact formulation of the inverted U hypothesis. Leuba (1955) in an attempt to integrate learning theories, advanced the concept of optimal stimulation. Reinforcement,

in terms of tension reduction, neglects the fact that much learning occurs during increased drive or tension. Learning, Leuba claimed, is dependent on the organism's present level of stimulation. When stimulation is low, only reactions which will augment stimulation are learned. This process is reversed when the organism's stimulation is high, i.e. only tension reducing reactions will be learned. Berlyne (1961) maintained a position similar to Leuba's. Berlyne combined the 'collative variables' of stimuli, referred to as arousal potential, and arousal. The collative variables of stimuli are most arousing in impoverished environments and least arousing during conditions of panic.

Easterbrook (1959) integrated drive level and cue utilization. Hebb (1955) combines, in an inverted U formulation, the drive arousing aspect of a stimulus and its behaviour guiding aspect. More physiological formulations of this hypothesis have been advanced by Malmo (1959) and Schlosberg (1954). In 1961 Fiske and Maddi posited a certain need for an optimal level of stimulation. Bruner (reported in Schroder et al, 1967) argued that the inability to go beyond given information, i.e., concreteness, increases whenever drive level is above or below a certain optimal level. A cognitive adaptation of the inverted U hypothesis was presented by Harvey, Hunt & Schroder (1961). The present research was partly based on the Harvey, et al, (1961)

implementation of the inverted U hypothesis, but more directly on the Schroder, Driver & Streufert, (1967) extension of the Harvey et al, (1961) theory.

Originally Harvey et al, (1961) were concerned with the integration of conceptual structure and environmental complexity; however, Schroder et al, (1967) replaced cognitive structure with information processing and environmental complexity with information complexity. They were concerned with the functional aspect of conceptual structure, i.e., information processing. Information processing is the actual on going handling, transmission, or generation of information. They proposed four systems or levels of information processing paralleling the four conceptual structures of the original formulation by Harvey et al, (1961).

A person's level of information processing is dependent upon the integrative complexity of his system for handling the incoming stimulation or information. A system is more integratively complex to the extent that certain dimensions can be combined or integrated in a number of different ways, and these rules or connections can themselves be combined or integrated. Dimensioning refers to how differentiated a structure can regard a certain range of stimulation, e.g., light can be dimensioned into hue, saturation, and brightness.

Schroder et al, (1967) claims that the best measure of

integrative complexity is the number of ways the system is able to relate or combine various dimensions rather than merely the number of dimensions the system is able to emit. The number and the integration of dimensioned stimulation is the crucial variable. A person low in integrative complexity would integrate, relate, or connect dimensions considerably less than a person high in integrative complexity.

Regardless of a person's overall level of information processing, his present level of information processing is dependent upon environmental complexity (Schroder, et al, (1967). For each specific level or system of information processing there is an optimal level of environmental complexity. A divergence from this optimum results in a decline in information processing for each system. Suboptimal environmental complexity would be comparable to a sensory deprivation experiment (Schroder et al, (1967), while super optimal environmental complexity would be stimulated in a very complex decision making task.

While four distinct systems or levels are postulated, most of the research has concentrated on the two extreme levels, the abstract persons who are high in integrative complexity, and the concrete persons, who are low in integrative complexity. Tuckman (1964) offered the

following description of persons low in integrative complexity:

> ...."undifferentiated schemata which generate simple rules for categorizing stimuli, and yield a reliance on external anchors, rules, and a highly delineated structure. Aspects of the world are viewed as absolute categories, and situations are approached in terms of fixed roles and role expectations.
>
> The main behavioural sub-referents include: (1) categorical, black-white thinking; (2) minimization of conflict and avoidance of ambiguity; (3) self definition in terms of external anchors; and (4) preservation of standards and minimization of alternatives."

The following is Tuckman's description of persons high in integrative complexity:

> ...."are characterized by schemata complex enough to handle a maximum of information of various kinds at a given time. Programs for handling this information can be generated, as one generates theory, for organizing a maximum of environmental diversity. Other people are primarily reacted to as a source of information."
>
> p. 472

Because this thesis was concerned with information request by persons differing in integrative complexity, and any effect environmental complexity may have on preferences, a review of the literature will be limited to research casting some light on these relationships.

Sieber and Lanzetta (1964) in an attempt to determine the interaction of uncertainty, importance, and problem solvability with conceptual structure, used Ss rated low and high conceptually. Amount of information requested and its importance were the dependent variables. An important finding was that the number of requests for information was positively related to problem uncertainty for the abstract subjects but not for the concrete Ss. This suggests that the abstract S is in some way more sensitive to environment change. The authors also reported that the abstract person demanded more information than the concrete person, or more important, exhibited more exploratory, or searching behavior than the concrete S in a novel or unstructured environment. Sieber and Lanzetta concluded that abstract persons are more sensitive to conflicting cues in the environment and that perceived environmental complexity is dependent on Ss conceptual structure.

Streufert and Schroder (1965) investigated decision making behavior when information load input, defined as the quantity of diverse information available, was varied over half-hour periods. The experiment involved participation in a group situation. The task was a tactical game simulating the invasion of a mythical island. The groups consisted of four men homogeneous with respect to congitive structure, either all abstract or concrete Ss. Using the number of integrations

in task performance as the unit of measurement, the relationship between number of integrations and information load was in the form of an inverted U. Moderate information load produced the greatest number of integrations, while smaller or greater information load produced a decrement in integrations. While the abstract persons were more integrative at all levels of information, the optimal input load, was the same for both groups. Thus, evidence for differential optimal load conditions for the different cognitive structures was not validated.

Streufert, Suedfeld, & Driver (1965) investigated delegated, and self-initiated information search, and integrative information utilization. Delegated information search was defined by a scale given to assess the desire for more or less information during the various load conditions. The number of self-initiated searches (search initiating within the group itself) for both types of groups, was highest during the suboptimal information load input condition, declining steadily until it was lowest at the superoptimal condition. Concrete persons requested more information at the suboptimal level and less at the superoptimal condition than the abstract persons. In fact, the abstract person remained relatively stable in his information request over the whole range of information load. The authors explained this apparent greater sensitivity

to input variation for concrete groups by the principle of integration. The concrete person is more stimulus bound in that he is less able to integrate or connect units of information. The abstract person, on the other hand is less dependent on particular or single stimuli because of his ability to integrate a number of specific stimuli. This difference in integrative ability was well substantiated when information utilization was considered. The relation of information load to integration was in the shape of an inverted U. The abstract group was higher integratively at all input levels, except for one suboptimal level. In another study, the number of self-initiated information searches was greater for concrete Ss than abstract Ss except in high load conditions (Suedfeld & Streufert, 1966).

The previous two studies demonstrated that the concrete person requested more information during both optimal levels and suboptimal levels of environmental complexity than the abstract persons. This is partially contrary to the theoretical expectations advanced by Harvey et al, (1961) who hypothesized the abstract person was information oriented while the concrete person avoided information. It is also contrary to the Sieber and Lanzetta (1964) findings.

Karlins and Lamm (1967) and Karlins, Coffman, Lamm, and Schroder (1967) attacked this apparent discrepancy. Karlins and Lamm

(1967) explained the previous two studies by noting that mere amount of information search does not necessarily differentiate Ss high and low in integrative complexity. Using a simulated community development task, a situation fairly complex and allowing considerable freedom in information acquisition prior to decision making, Karlins and Lamm (1967) found that abstract subjects ask significantly more novel questions than the concrete Ss. In another study, Karlins, et al, (1967) demonstrated that concrete Ss asked monitering type questions while the abstract Ss searched more than concrete subjects and asked questions that were more problem oriented than the integratively simple Ss. The concrete Ss were primarily concerned with factual details. The authors (Karlins and Lamm 1967), commented on the differential approach to different environments for persons high and low in integrative complexity:

> ..."These findings lend credence to the notion that when subjects varying in integrative complexity are allowed to learn a task by active manipulation of the environment, they approach that environment differently. Subjects who are integratively complex are more active in this interdependent environment, asking more questions concerning their problem. In the present problem, with many degrees of freedom and a good deal of complexity, it is argued that the integratively complex individual will ask more questions because he has more perspective to assist him in generating questions. In tasks that do not require this form of information acquisition, no performance differences by individuals varying in integrative complexity would be expected."

For the purposes of this thesis the salient consideration evidenced from the research by Karlins and Lamm (1967) is the importance of the type of information request. If persons varying in integrative complexity seek different information, do they actually prefer different information in all environments? Research by Tuckman helps to answer this question. In 1964 Tuckman, demonstrated that groups consisting primarily of abstract Ss sought more information than groups composed primarily of concrete Ss. However, a later study using structured and unstructured tasks, cast more light on differential information preference. Tuckman (1967) found that groups composed primarily of abstract Ss performed significantly better on the unstructured task than did groups of concrete Ss; but that there was no conceptual differences in solving the structured task. Tuckman (1967) argued that the unstructured task, with its greater complexity and large number of degrees of freedom, is the environmental counterpart of an integrative complex cognitive structure and the structured task is the environmental counterpart of a simple cognitive structure.

This conceptual structure-environmental complexity parallel helps to explain why the abstract groups performed better than the concrete groups in the complex (unstructured) environment but not in the simple (structured) environment. If, as Tuckman argued, there is an

environmental counterpart of a cognitive structure, then the next logical step (somewhat substantiated by Tuckman's 1967 findings) would be the existence of an environmental structure preference. This concept is a slight extension of a Schroder et al, (1967) postulate. They postulated that each cognitive system will have different levels of optimal environmental or informational complexity for optimal information processing.

Two studies (Suedfeld, and Streufert (1966) and Suedfeld (1967) approached the interaction of the variables of information complexity and cognitive complexity. With information complexity as the dependent variable, Suedfeld & Streufert, (1966) found that the number of correct solutions for Ss high or Ss low in integrative complexity was the same when the information was low in complexity. However, the conceptually complex Ss were able to solve problems of high informational complexity significantly more than Ss low in integrative complexity. Information complexity was operationally defined as the number of cues needed to obtain all the information--the more complex the more cues needed. In the latter study Suedfeld, (1967) investigated information complexity and rate of input. Input rate significantly affected information processing. More complex problems were solved at the moderate input rate than simple ones. The reverse was reported for a high rate of input. Ss were not categorized as high or low in cognitive complexity.

The above group of studies have indicated that information is responded to differentially by persons differing in conceptual structure. It would appear from Tuckman's (1967), Suedfeld & Streufert's (1966) and Suedfeld's (1967) findings that information complexity, i.e., integration of units of information is an important variable. These data suggest that persons varying in integrative ability prefer different levels of environmental complexity. However, the above studies have empirically examined the importance of information complexity only during slightly below optimal, optimal, and above optimal levels of environmental complexity.

In brief, several studies, using optimal and near optimal environment, have demonstrated that concrete persons requested more stimulation than abstract persons, while others have reported the reverse. However, other variables besides magnitude of request have emerged. These are the type of stimulation available, the complexity of the stimulation, and the level of environmental complexity within which the stimulation is available. Yet little research has been directed to examining the interaction of these variables with conceptual structure.

Harvey, et al, (1961) and Schroder, et al, (1967) linked cognitive structure with motivational principles. They hypothesized that the

individual has a drive to attain or retain optimal cognitive functioning; therefore, an optimal level of environmental complexity.

Above or below this optimum, structural regression takes place (see Suedfeld, (1963) and Hewitt (1966) for a more detailed discussion of this point). Structural regression implies that cognitive functioning or integrative ability is operating below potential due to a dearth of stimulation or a bombardment of stimulation. It is proposed that the individual will be motivated to rise to a more complex level of functioning or fall to his optimal level.

As previously stated each level of cognitive complexity has its optimum level of cognitive functioning. Since it has been demonstrated that persons high in integrative ability do in fact integrate more and have a higher optimum level of integration than persons low in integrative ability a decrease in environmental complexity by SD may be more arousing or motivating to them than the concrete subjects. In fact, Suedfeld (1964) found that Ss high in cognitive complexity did find SD conditions more unpleasant than Ss low in conceptual complexity. This differential arousing aspect of SD implies that the effect of each level of environmental complexity may be determined by the persons conceptual structure. Also, the stimulation required by persons differing in conceptual structure may also be different. Research

by Suedfeld (1964) and Hewitt (1966) have helped to clarify the above differential information utilization and arousal during SD for persons varying in integrative ability.

Both Suedfeld (1964) and Hewitt (1966) compared attitude change between abstract and concrete Ss under SD and Non-SD. Suedfeld manipulated a S's attitude towards an ethnic group; Hewitt manipulated a S's attitude toward himself, i.e., his self-concept. In both cases the concrete Ss changed their attitudes more than the abstract subjects in the SD conditions. However, there was no significant attitude change, in either study for abstract or concrete Ss in the Non-SD condition. There was no attitude change for the abstract Ss in the SD condition. The two studies cited above demonstrated that the influence of the same stimulation, during SD, was much more pronounced for concrete Ss than for abstract subjects.

Suedfeld and Vernon (1966) attempted attitude change in abstract and concrete Ss. As before, concrete Ss were manipulable, changing their attitude significantly more than abstract Ss. There were no differences between abstract and concrete Ss in compliance or attitude change in the Non-SD condition. Compliance was measured by the number of times a S gave a response that was contrary to his attitude.

As a result of compliance new information was received. This means that abstract Ss were more motivated to gain or acquire new information than concrete Ss. The above study gives some indication that type of information may in fact be a very crucial variable in information request during SD. The abstract Ss request novel information; the concrete Ss avoid it.

Although there is little research in this area, there is some evidence that SD produced differential effects on person varying in integrative complexity. During SD persons of different conceptual structures react differently to stimulation (Hewitt, 1966), and Suedfeld, 1964), and differentially request available stimulation (Suedfeld, & Vernon, 1966). If SD is noxious then persons varying in integrative complexity may differentially seek out ways to retain their optimum level of functioning. For example, abstract persons may seek either novel or complex stimulation, while the concrete persons seek constant and simple stimulation. The type of stimulation or stimulational properties preferred during various levels of environmental complexity have not been empirically examined.

Research has demonstrated SD to be a reliable method of producing a need for stimulation. In a series of studies by Jones and

his associates (summarized in Jones (1966)) information, as a dependent variable, defined as reduction in uncertainty, was investigated. Using SD to reduce the level of incoming information, they concluded that information is a drive variable, i.e., lack of information produced a drive for information. This was evidenced in research demonstrating that Ss in SD preferred to press a button of maximal information value rather than buttons offering less information. For purposes of this discussion the fact that Ss exhibit a need or request information or stimulation is the important result.

Other studies have used less refined stimuli than Jones and his associates. In an early study providing access to stimulation during SD Vernon & McGill (1960) found that persons who request stimulation to a considerable degree were those Ss who requested early release. Thus, stimulus request may be indicative of stress during SD and a reliable measurement of it.

In a series of studies to investigate the relationship between button pressing for time off from SD and stress during SD Rossi and Solomon found:

(1) there was greater button pressing for time off rather than merely for the activity of button pressing and button pressing was positively related to a psychological index of unpleasantness of SD (1964a);

(2) there was a positive relationship between amount of time off promised and button pressing (1964, b);

(3) high button responders rated themselves as more discomforted during SD than non responders (1964, c); and

(4) Ss in a comfortable condition (which was actually a less severe form of SD than the uncomfortable condition) requested significantly less time off than Ss in the uncomfortable condition. (1964, d). The above studies indicate that Ss will attempt to avoid SD, and number of time off requests can give some indication of the S's index of discomfort during SD.

Other studies have demonstrated the rewarding aspects of physical stimulation during SD. Goldstein (1965) found that SD Ss requested more visual stimulation than non SD subjects, and more visual stimulation than mere requesting activity. All Ss were tested in the same experimental setting.

In another series of studies Smith & Myers (1966) summarized some of the evidence for stimulation seeking during SD. They tentatively concluded that there is a general need for stimulation. Using the same Ss for 24 hours of SD and 24 hours of non-SD they report that SD produced a significant increase in time spent listening

to a rather boring stock market report (1966). In longer periods of SD (seven days) Smith, Myers & Johnson (1967) reported that SD Ss request more stimulation (Stock market report) than non-SD and the differences increased over time. They also found that those who requested early release could be predicted by the greater amount of stimulus requests they made in the first day. Also stimulus requests increased over time for the SD Ss while it decreased for the non SD Ss.

Although the above studies are limited in determining the exact nature of the stimulation needed, they do indicate a need during SD for external stimulation. Greater requesting behaviour appears to be somewhat reliable index of stress during SD. However, the exact nature of the requesting during SD, when persons vary in integrative complexity, and when the available stimulation varies in complexity has not been investigated.

Explication of the research (Hewitt, 1966, Suedfeld, 1964, and Suedfeld & Vernon, 1966) which has dealt with the interaction of SD and conceptual structure may be grouped into:

(1) the concrete Ss greater need for stimulation per se. (A conclusion not supported by Suedfeld (1964) and Suedfeld & Vernon (1966);

(2) the abstract Ss greater ability to integrate discrepant information into an attitude syndrome, regardless of the tentative differential need for stimulation;

(3) the concrete person is anchored to immediate experience and unable to go beyond present stimulation;

(4) the differential effect different stimulation may have had on different conceptual structures; and

(5) the stimulation offered was not sufficiently complex to appeal to or influence the abstract Ss.

The Problem

Research generated by Harvey et al, (1961) has indicated that persons varying in integrative complexity behave differently. Whether or not these differences are extant for all possible levels of environmental complexity and more importantly the relationship between different levels of integrative complexity and environmental complexity (the inverted U hypothesis) has received little investigation. One area, SD, has received little attention. One behavioural difference, is the nature of stimulation that persons of different conceptual structure request. This thesis is concerned with one stimulation variable, namely, information complexity. The purpose of this thesis is to determine whether or not persons varying in integrative complexity prefer different levels of information complexity during SD.

If SD is drive producing in that it produces a need for stimulation, then any differences in information preference for persons high and low in integrative complexity, should be exhibited during a condition of SD. The abstract Ss should prefer the more complex information; the concrete Ss the less complex information. This preference should be evidenced because of (1) the drive arousing aspect of SD itself, (2) the hypothesized structural regression SD

produces on conceptual structures in general and (3) the differential information complexity preference. This preference will not be as apparent during conditions of Non-SD, normal stimulation, because (1) of the lack of need for information, i.e., sufficient stimulation is available, and (2) no structural regression. The major hypothesis (Hypothesis I) of this research is as follows:

> Under conditions of SD persons high on integrative ability will request complex information more than simple information; whereas persons low in integrative complexity will request simple information more than complex information.

Another hypothesis, confined to the experimental design of this research was made concerning the number of requests made during SD by persons varying in integrative complexity. Although there were two levels of stimulation complexity available, the two levels remained the same throughout the experiment. Due to the sameness (a restriction of the design used in the research) of the stimulation and the concrete persons greater dependence on

stimulation concrete persons should request, during this experiment, more stimulation than the abstract persons The hypothesis (Hypothesis II), specific to this thesis, is as follows:

> During SD persons low in integrative complexity will request more information than persons high in integrative complexity.

Method

Subjects and Selection

In the fall of 1968 all Freshmen and introductory Psychology students at the U. of A. were mass administered a battery of tests. Included in this battery was the Individual Topical Inventory (ITI) (Tuckman, 1966). On the basis of this test the person's level of conceptual complexity was ascertained. Twenty persons classed as abstract and twenty classed as concrete were randomly selected to serve in this experiment. All the Ss were male.

Individual Topical Inventory

The ITI is a forced-choice instrument in which the S is asked to choose one of a pair of items that best represents his response to various interpersonal topics, namely (a) when criticized, (b) in doubt, (c) when a friend acts differently toward you, (d) beliefs about people in general, (e) feelings about leaders, and (f) feelings about rules. For each interpersonal topic there are six pairs of alternatives, each response representing a typical response. All possible paired combinations of the four systems comprise the six pairs. A S is given a score for each system, the maximum being 18 for any system. For a

S to be placed in a certain system he must be above the 10th percentile in only one system according to norms that were established by Tuckman. See Appendix A for test and scoring procedure.

Messages [1]

Two messages identical in information or content but differing in complexity were constructed by the E. One message the simple (SM), presented the items of information independent, and unrelated to the other items of information. The other message, the complex (CM) presented the items of information in a dependent and inter-related manner. In the SM message the meaning of any particular item of information was not dependent upon other items of information. In the CM the meaning of each item of information was dependent upon other items of information. In general the CM used longer sentences and more adverbs than the SM. The sentences in the CM were clausal type sentences while the SM sentences tended to be simple active affirmative and declarative type sentences. Prior to running of the experiment ten graduate students in Psychology at the University of Alberta judged the two messages and reported gross differences in the two messages. [2] The SM was two minutes thirty seconds long, the CM was two minutes forty seconds long. See Appendix B for the CM and SM. Both messages were available during the experiment.

Heart rate was tape recorded by means of a standard EKG electrodes. One was attached to the right and above the heart, one to the left and below the heart, and the ground to the central and

---

[1] Both messages wereadaptations of a message in Saint Exupery's Wind, Sand, and Stars. Harcourt & Brace, 1949.

[2] Also post experimentally both messages were judged for complexity. The CM was judged, on a seven point scale, significally more complex than the SM ($t = 4.97$, $df = 27$, $p < .01$). All 28 Ss, randomly selected, judged both messages in a completely counterbalanced design.

lower portion of the rib cage. These data were not used because of methodological problems, e.g., noise, movement of Ss.

A questionnaire (See Appendix C) designed to ascertain the Ss' subjective feelings during the experiment was administered after the completion of the experiment.

Sensory Deprived Condition

The room and tape recording facilities were much the same as those described by Hewitt (1966). The room itself was windowless and approximately 8' x 10'. The clock was covered and muffled by paper. The room was illuminated throughout the experiment. Although the room was relatively sound proof, the tape recorder which was recording heart rate was placed at the door of the SD room and provided an excellent "masking" noise.

A roll-away bed was used; however, it was not laid flat, but one end rested against a wall producing an angle of approximately 120 degrees to the remaining part of the bed which was placed in the normal flat position. Thus, Ss did not lay completely flat, but almost in a sitting position. The bed faced the wall opposite the door entrance.

On both sides of the bed, and within easy access there was a chair on which a speaker and switch were placed. A pressing

of the switch relayed a signal to the E. On receiving the signal the E would turn on the requested message. The process took from one to three seconds. The control panel and E were situated about forty-two feet away.

The SD Ss wore translucent goggles that allowed light to penetrate, but prevented the perception of form. Ordinary cotton work gloves were worn by the Ss over which were placed arm bands extending from the elbows past the fingers to curtail tactile stimulation.

Non Deprived Condition

The non deprived (ND) room was diagonal to the SD room and measured approximately 11' x 9'. It was illuminated throughout the experiment. A window covering the upper half of one wall provided an excellent view of the campus and surrounding city.

To the left of the door was a large table on which were placed the speakers and message switches. The hearing of a message for a S in the NS condition was contingent upon the same procedure as the S in the SD condition. To provide a somewhat adequate amount of stimulation playing cards, a tinker toy, and magazines (Sports Illustrated, Time, and National Geographic,--the same editions for all Ss) were available for use by the Ss.

Another chair, and a black board were also present in the ND condition. There was an ash tray for those who smoked.

The ND S was not restricted seriously in any manner, except by the electrodes, but they did not prevent movement. The window of the door to the ND room was covered for the outside. The E could not see in, and the S could not see out.

Procedure

Ten Ss categorized as System I from scores on the ITI were randomly assigned to the SD condition and ten to the ND condition for four continuous hours. The same procedure was carried out for the System IV Ss. All Ss were contacted one to three days prior to the actual running of the experiment. Some Ss were given one credit per hour (22) and others, one dollar per hour (18). During the initial telephone contact very little was conveyed concerning the experiment except the time, four hours, and that it would be nothing extremely demanding. The S was instructed where to come, what time, not to wear a T-shirt, and to wear a shirt which could be unbuttoned so that an instrument for taking heart rate could be attached.

Ss usually arrived ten to fifteen minutes early upon which they were lead to a waiting room and given the instructions (see Appendix D) to read and told to wait ten minutes. The instructions

emphasized the procedure for message request, and the importance of the S staying the full amount of time.

After about ten minutes the E lead the S to the SD or ND rooms. If there were two Ss for that particular time the ND S was set up first. The E asked if the S understood the instructions. Despite the reply, the method of requesting the information was demonstrated, and the fact that he was only to request a message when he wanted to and not continuously. Every attempt at communication was kept at a minimum.

The electrodes were attached first for both SD and ND Ss. After the S in the ND had his electrodes attached the E said that the experiment would begin in about five minutes, because certain equipment had to be checked. A knock on the door was the signal for the beginning of the experiment. For the SD Ss the above was the same except that after the electrodes were attached he was asked to sit down on the roll-away bed so that the remaining equipment could be attached and adjusted. For all Ss watches were removed and returned at the end of the experimental session.

At the end of the session all subjects were given a short questionnaire designed to get at some of their personal impressions

of the session.

Information on release to the Ss was minimal, and discussion of personality and message differences avoided. The E merely elucidated on the investigation of the differences between SD and ND conditions. Ss were then either paid or given credit. A t test for the number of requests made between paid Ss and credit Ss was non-significant. Any S who requested early release was given credit or paid up to the time of release. Eight concrete Ss, all in the SD condition, requested early release as compared to two abstract Ss. Although too small for reliable comparison it would appear that the concrete S was more stressed than the abstract S. Research in the area of SD demonstrated that request for early release to be indicative of greater stress (Vernon and McGill, 1960). This is contrary to the findings of Suedfeld (1966) who found SD to be more stressful for abstract than concrete persons.

Results

The dependent variable was number of message requests. A 2 x 2 x 2 x 8 analysis of variance repeated measurements design was employed in which there were two levels of conceptual structure, two levels of environmental complexity, two levels of message complexity and 8 levels of time representing one half hour intervals over four hours. See Appendix E for the raw data and Appendix F for the summary of the analysis of variance.

There was a highly significant environmental complexity main effect, ($F = 95.39$, $df = 1, 36$, $p < .01$). During SD the mean number of requests was 19.35 as compared to 8.0 during the Non-SD condition. Time also yielded a significant main effect, ($F = 16.94$, $df = 7, 252$, $p < .01$). The average request for the first half hour period to the final was as follows: 3.65, 2.45, 1.85, 1.47, 1.57, 1.15, 1.05, and 1.07. The importance of time for this thesis is the actual trend of requesting which will be reported in the trend analysis.

There was a significant interaction between conceptual structure and message complexity ($F = 5.42$, $df = 1, 252$, $p < .01$). Table 1 presents the mean number of requests for this information.

Table 1

Mean Requests for Type of Message by

Concrete and Abstract Persons

	complex message	simple message
Concrete	8.1	9.5
Abstract	5.9	4.4

The remaining significant finding was the conceptual structure, message complexity, environmental complexity interaction ($F = 8.28$, $df = 1, 252$, $p < .01$). See Appendix G for a graphic portrayal of this interaction. This interaction directly supported Hypothesis I. Table 2 presents the mean number of requests for this interaction. Mean values which have different subscripts are different from each other at the .01 level of significance. Duncan's Multiple Range Test was used; see Appendix H. This pattern of differences implies that the concrete Ss requested significantly more information than the abstract Ss during SD (Hypothesis II).

Table II

Mean Requests for Type of Message by

Concrete and Abstract Persons

During SD and Non-SD Conditions

	Concrete		Abstract	
	complex message	simple message	complex message	simple message
SD	11.6_a	14.9_b	8.1_c	5.1_d
Non-SD	4.6_e	3.9_e	3.7_e	3.8_e

The analysis for differential request over half hour periods indicated a significant overall negative linear ($F = 98.17$, $df = 1, 540$, $p < .01$), quadratic ($F = 25.16$, $df = 1, 540$, $p < .01$), and cubic ($F = 5.49$, $df = 1, 540$, $p < .05$) trend. Figure 1 of Appendix H graphically presents their significant trends. These overall significant patterns in requests indicated some general pattern in stimulation request within the design of this experiment.

There is a significant linear ($F = 4.69$, $df = 1,540$, $p < .05$) environmental complexity conceptual structure interaction. Figures III and IV of Appendix J help convey this interaction. A comparison of Figures III and IV indicate that there was little difference in the pattern of requesting for the two conceptual structure groups during the Non-SD condition. However, there were marked differences in the request pattern during SD. There was a steady decline for both abstract and concrete Ss until two hours, after which the abstract Ss increased their requests for one-half hour period, then decreased their message request. However, the concrete Ss showed a steady decrease in message request until 2-1/2 hours, at which time they showed a steady decrease in requesting up until the experiment's termination. During the last one and one-half hours of the experiment the abstract increased their requests, while the concrete Ss decreased their requests.

There was a significant linear ($F = 6.20$, $df = 1,540$, $p < .025$) and quadratic ($F = 5.98$, $df = 1,540$, $p < .05$) component for the conceptual structure, message complexity interaction. See Figures V and VI in Appendix J for a graphic illustration of this interaction. For the complex message the differences between abstract and concrete Ss is apparent. The concrete Ss showed a steady decrease in their request and sharp fall during the last half hour of the experiment. The abstract Ss, on the other hand, showed a rapid decline in number of complex

requests, until 1-1/2 hours, after which there was a slight, but steady, increase until the experiment's termination. Overall, the abstract Ss increased their request for complex messages, while the concrete Ss decreased their request for the same message. Figure VI of Appendix J shows the pattern of requests of the simple message for the two personality sub-groups. Overall the reverse of the complex message pattern appears to have happened for the simple message. The abstract Ss decreased in their request for the simple message, while the concrete Ss increased in their request for the simple message.

Figures VII to X in Appendix J plot the significant linear ($F = 7.59$, $df = 1,540$, $p < .025$), and quadratic ($F = 5.58$, $df = 1,540$, $p < .05$) conceptual structure, environmental complexity, message complexity trend interaction. Thus, the significant conceptual structure, message complexity interaction is further clarified by the environment variable. The difference in the pattern of the types of message request by persons of different conceptual structures is different for the Non-SD and the SD conditions. Inspecting Figures VII to X we find little difference during the Non-SD condition (Figures IX and X). During SD the concrete Ss increased their request for the simple message, and decreased their request for the complex message. The pattern is reversed for the abstract Ss.

Four questions on the questionnaire presented to each S after the completion of the experiment, were scaled on a 7 point scale. The questions were addressed to: (1) the pleasantness-unpleasantness of the experiment, (2) the interestingness-uninterestingness of the messages, (3) the easiness-difficulty of message understanding, and (4) the need or no need for stimulation during the experiment. (Each question was analyzed by a 2 x 2 analysis of variance (See Appendix K). There was a significant environmental complexity (SD-Non SD) main effect ($F = 7.48$, $df = 1, 36$, $p < .01$). The message was easier to understand during the SD condition than the Non-SD condition. The average scale value during Non-SD was 4.5; during SD 5.85. Two other main effects were significant, both in the analysis of the need for stimulation. The A main effect, conceptual complexity was significant ($F = 5.43$, $df = 1, 36$, $p < .05$), as was the B main effect, environmental complexity ($F = 26.30$, $df = 1, 36$, $p < .001$). There was a greater need for stimulation during SD, the average scale value for SD was 5.15 for Non-SD 3.14. Importantly the abstract Ss expressed a greater need for stimulation, with average scale value of 4.3 than the concrete Ss who had an average value of 4.8.

Discussion

Both hypotheses of this thesis were supported by the data. Persons low in integrative complexity requested more stimulation than persons high in integrative complexity during SD, but not during the Non-SD condition (Hypothesis II). Persons low in integrative complexity preferred a simple message rather than a complex message during SD, while persons high in integrative complexity preferred a complex message rather than the simple message. As predicted, this differential preference was not extant during the Non-SD condition (Hypothesis I).

With respect to magnitude of requests, this thesis replicated one consistent finding in the area of SD. Regardless of conceptual structure SD produced a significantly greater request behaviour than did Non-SD. (This was substantiated by the significant environmental complexity main effect of need for stimulation in the post experiment questionnaire). Number of requests has been correlated with a stressful reaction to SD. However, when personality variables, and type of stimulation available is considered, the above relationship is modified.

Hypothesis II which dealt with the magnitude of requests and which was specific to the experimental design of this research received indirect support. Concrete persons requested more stimulation than the abstract persons presumably

because of their inability to integrate items of information. A concrete persons is highly stimulus dependent. Due to the fact that each stimulus results in few integrations he must seek more stimulation to either retain or maintain his optimal level of cognitive functioning. The abstract person, on the other hand, is more able to integrate and consequently is less dependent upon stimulation to retain or maintain his optimal level of cognitive functioning. The abstract person's cognitive structure is much more self generating, and consequently, is less dependent on magnitude of stimulation than the concrete person's cognitive structure.

Differential stress reaction to SD may account for the above results. Persons low in integrative complexity request more stimulation than persons high in integrative complexity because they are more stressed by SD. This is supported by research in the area of SD, which has demonstrated a positive relationship between stress and requesting, and by the fact that in this experiment, more concrete Ss (6) requested early release than abstract Ss (2). As stated previously, magnitude of request may neither adequately index differential stress during SD, nor differentiate persons varying in integrative complexity. Stimulation variables other than magnitude may be more important and/or better indices of differential response to SD.

Another possible explanation is that the concrete Ss were more influenced by the normative structure of the experiment. One prominent "norm" might have been to request information. However, this explanation seems untenable for several reasons. One main reason was that the E emphasized several times that they were to request information only when they desired it.

The major hypothesis of the research was concerned with information or stimulation complexity preference. During SD the abstract Ss preferred the complex message, the concrete Ss the simple message. Therefore, persons varying in conceptual structure may have a unique type of stimulation that is most effective for mitigating stress. Stimulation complexity may interact with other variables such as content, source. For example, in a further interpretation of Hewitt's results (1966), Hewitt & Rule (1968) have proposed that the complexity of the communication they employed to change attitude may have been important. Those Ss who resisted attitude change during SD, the abstract, may have altered their attitude in the desired direction if the communication had been more complex in its construction.

Also, in the present study, the significant increment in requesting after two hours for all Ss may indicate a rise in stress, indicated by the significant overall quadratic trend component. Therefore, this time would be most effective for attempting some type of manipulation, e.g. attitude change through stimulation.

An important consideration is whether the preference demonstrated during SD is present throughout the whole range of environmental complexity. This question cannot be directly answered by this thesis. There may have been a preference extant and operative during the Non-SD conditions, but the method of data collection did not sufficiently measure all stimulation which the Ss may have handled during the experiment. The question appears to be whether or not sensory deprivation is uniquely motivating such that preferences become operative; or whether it is merely an experimental manipulation to extricate and permit measurement of variables operating across the total activation continuum. That SD is an experimental manipulation is somewhat, but not unequivocally, supported by the reported significant differences in normal environmental conditions, e.g. decision making, problem solving in conceptual complexity. It is the present author's contention that differences in preferences, between varying levels of conceptual structures, are operative or at least latent, throughout the whole range of activation, that is information complexity preferences prevades all levels of activation.

In concluding, this research supports the contention that there is a preference for complexity of information during SD. There may be other informational properties such as content or communicator importance, that interact with the complexity variable. With respect to SD, the problem appears to be whether or not SD activates a preference.

APPENDICES

APPENDIX A

INDIVIDUAL - TOPICAL INFORMATION

(Form A)

Name_____ School_____

INSTRUCTIONS

You will be given some situations and topics to which we would like you to respond. The responses are given in pairs. You are to choose one response from each pair. Choose the response that most closely fits your opinion or feeling and indicate your choice by circling the letter "A" or "B" corresponding to the response chosen. Always choose one member of each pair. Never choose both members of the pair and do not skip over any of the pairs. If you agree with both, choose the one you agree with most strongly. If you do not agree with either, choose the one you find the least disagreeable of the two.

Example:

Here is an example of the way the questions will be asked and the way they should be answered. The manner in which you will indicate your choice between the two given responses is illustrated below:

When I am confused . . .

Pair No.

(i)

A	B
I try to find a solution and end the confusion.	I completely ignore the fact I am confused.

(ii)

A	B
I break out into a nervous sweat.	I remain calm at all times.

How to respond:

First: Decide which response you agree with most.

Second: Indicate which response you agree with most by circling the identifying letter. Thus, if in comparing the first pair of statements, you agree with the statement, "I try to find a solution and end the confusion , "more than with the statement, "I completely ignore the fact that I am confused," you would circle the letter "A" (above the chosen statement). Having chosen one (never both, never neither) statement from the first pair of statements, you would then move on to the second pair. If, in considering the second pair, you find that you agree more with the statement, "I remain calm at all times," (as compared to the statement, "I break out into a nervous sweat") you would circle the letter "B".

On the pages that follow there are 36 different pairs of responses. There are six pairs on a page. You are to select one response from each pair, the one that more accurately shows your opinion or feeling

and record your choice by circling the letter indicating the statement chosen. Be frank and indicate, in each case, your true feeling or opinion or the reaction which you actually would make in the situation. Do not indicate how you should feel or act; rather, indicate how you do feel and act.

Make sure that you are aware of the situation or topic that each pair of responses refers to. You will find the situation or topic identified at the top of each page. All items on the page refer to the situation or topic appearing at the top of that page.

When you are finished, your paper should contain 36 circles. Check back and make sure that you have made 36 choices, no more no less.

Remember: (1) Respond only once for each pair; that is, choose one member of the pair, never both, never neither. Indicate your choice by circling either "A" or "B".

(2) When you are finished you should have made 36 circles.

Work at your own rate of speed but work straight through the inventory without stopping. Once you have completed a page do not return to it.

YOU MAY BEGIN

1. Imagine that someone has criticized you. Choose the response from each pair that comes closest to your feelings about such criticism. Indicate your choice by circling either "A" or "B".

When I am criticized . . .

Pair No.		
A	(1)	B
I try to take the criticism, think about it, and value it for what it is worth. Unjustified criticism is as helpful as justified criticism in discovering what other people's standards are.		I try to accept the criticism but often find that it is not justified. People are to quick to criticize something because it doesn't fit their standards.
A	(2)	B
I try to determine whether I was right or wrong. I examine my behavior to see if it was abnormal. Criticism usually indicates that I have acted badly and tends to make me aware of my own bad points.		It could possibly be that there is some misunderstanding about something I did or said. After we both explain our viewpoints, we can probably reach some sort of compromise.

APPENDIX A (cont'd)

Pair No.		
A	(3)	B
I listen to what the person says and try to accept it. At any rate, I will compare it to my own way of thinking and try to understand what it means.		I feel that either I'm not right, or the person who is criticizing me is not right. I have a talk with that person to see what's right or wrong.
A	(4)	B
I usually do not take it with good humor. Although, at times, constructive criticism is very good, I don't always think that the criticizer knows what he is talking about.		At first I feel that it is unfair and that I know what I am doing, but later I realize that the person criticizing me was right and I am thankful for his advice. I realize that he is just trying to better my actions.
A	(5)	B
I try to ask myself what advantages this viewpoint has over mine. Sometimes both views have their advantages and it is better to combine them. Criticism usually		I am very thankful. Often I can't see my own errors because I am too engrossed in my work at the time. An outsider can judge and help me

A	(6)	B
helps me to learn better ways of dealing with others.		correct the errors. Criticism in everyday life usually hurts my feelings, but I know it is for my own good.
It often has little or no effect on me. I don't mind constructive criticism too much, but I dislike destructive criticism. Destructive criticism should be ignored.		I try to accept and consider the criticism. Sometimes it has caused me to change myself; at other times I have felt that the criticism didn't really make much sense.

2. Imagine that you are in doubt. Choose the response from each pair that comes closest to your feelings about such doubt. Indicate your choice by circling either "A" or "B".

When I am in doubt . . .

Pair No.		
A	(7)	B
I become uncomfortable. Doubt can cause confusion and make one do a poor job. When one is in doubt he should ask and be sure of himself.		I find myself wanting to remove the doubt, but this often takes time. I may ask for help or advice if I feel that my questions won't bother the other person.
A	(8)	B
I don't get too upset about it. I don't like to ask someone else unless I have to. It's better to discover the correct answer on your own.		I usually go to someone who knows the correct answer to my question. I go to a book which will set me straight by removing the doubt.
A	(9)	B
I first try to reason things out and check over the facts. Often I approach others to get ideas that will provide a solution.		I think things over, ask questions, and see what I can come up with. Often several answers are reasonable and it may be difficult to settle on one.

Pair No.		
A	(10)	B
I realize that I'll have to decide on the correct answer on my own. Others try to be helpful, but often do not give me the right advice. I like to judge for myself.		I usually try to find out what others think, especially my friends. They may not know the answer, but they often give me some good ideas.
A	(11)	B
I look over the problem and try to see why there is a doubt. I try to figure things out. Sometimes I just have to wait awhile for an answer to come to me.		I try to get some definite information as soon as possible. Doubt can be bad if it lasts too long. It's better to be sure of yourself.
A	(12)	B
I consider what is best in the given situation. Although one should not rush himself when in doubt, he should certainly try to discover the right answer.		I act according to the situation. Sometimes doubt can be more serious than at other times and many of our serious doubts must go unanswered.

3. Imagine that a friend has acted differently toward you. Choose the response from each pair that comes closest to your feelings about such an action. Indicate your choice by circling either "A" or "B".

When a friend acts differently toward me . . .

Pair No.		
A	(13)	B
I am not terribly surprised because people act in many different ways. We are different people and I can't expect to understand all his reasons for acting in different ways.		I am usually somewhat surprised but it doesn't bother me very much. I usually act the way I feel towards others. People worry too much about others' actions and reactions.
A	(14)	B
I find out why. If I have done something wrong I will try to straighten out the situation. If I think he's wrong, I expect him to clear things up.		I feel that I may have caused him to act in a different way. Of course, he may have other reasons for acting differently which would come out in time.

Pair No.

A	(15)	B
I first wonder what the trouble is. I try to look at it from his viewpoint and see if I might be doing something to make him act differently toward me.		It is probably because he has had a bad day, which would explain this different behavior; in other cases he may just be a changeable kind of person.
A	(16)	B
It is probably just because something is bothering him. I might try to cheer him up or to help him out. If these things didn't work I would just wait for him to get over it.		I try to understand what his different actions mean. I can learn more about my friend if I try to figure out why he does things. Sometimes the reasons may not be very clear.
A	(17)	B
There has to be a definite reason. I try to find out this reason, and then act accordingly. If I'm right I'll let him know it. If he's wrong, he		I usually let him go his way and I go mine. If a friend wants to act differently that's his business, but it's my business

A	(18)	B
should apologise.		if I don't want to be around when he's that way.
I don't get excited. People change and this may cause differences. It is important to have friends, but you can't expect them to always be the same.		I like to get things back to normal as soon as possible. It isn't right for friends to have differences between them. Whoever is at fault should straighten himself out.

4. Think about the topic of people in general. Choose the responses from each pair that comes closest to your thoughts about people. Indicate your choice by circling either "A" or "B".

This I believe about people . . . .

	Pair No.	
A	(19)	B
Whatever differences may exist between persons, they can usually get along if they really want to. Although their ideas may not agree, they probably still have something in common.		People can learn from those who have different ideas. Other people usually have some information or have had some experience which is interesting and can add to one's knowledge.

Pair No.		
A	(20)	B
People can act in all sorts of ways. No single way is always best, although at certain times a particular action might be wiser than others.		Each person should be able to decide the correct thing for himself. There are always a few choices to be made and the individual himself is in the best position to pick the right one.
A	(21)	B
Some people think they know what's best for others and try to give advice. These people shouldn't make suggestions unless asked for help.		There are certain definite ways in which people should act. Some don't know what the standards are and therefore need to be straightened out.
A	(22)	B
I can tell if I am going to get along with a person very soon after meeting him. Most people act either one way or another and usually it is not difficult to say what they are like.		It's hard for me to say what a person is like until I've known him for a long time. People are not easy to understand and often act in unpredictable ways.

Pair No.		
A	(23)	B
People have an outside appearance that usually isn't anything like what can be found on the inside, if you search long and hard enough.		Each person is an individual. Although some people have more good or bad points than others, no one has the right to change them.
A	(24)	B
People can be put into categories on the basis of what they're really like. Knowing the way a person really is helps you to get along with him better.		People are unlike one another in many respects. You can get along with people better and better understand them if you are aware of the differences.

5. Think about the general topic of leaders. Choose the response from each pair that comes closest to your thoughts about leaders. Indicate your choice by circling either "A" or "B".

Leaders . . .

Pair No.

A	(25)	B
Leaders do not always make the right decisions. In such cases, it is wise for a man to look out for his own welfare.		Leaders are necessary in all cases. If a leader cannot make the right decisions another should be found who can.

A	(26)	B
Leaders cannot provide all the answers. They are like other people -- they have to try to figure out what action is necessary and learn from their mistakes.		Leaders make decisions sometimes without being sure of themselves. We should try to understand this and think of ways to help them out.

A	(27)	B
I like a leader who is aware of how the group feels about things. Such a leader would not lead any two groups in exactly the same way.		A person should be able to put his confidence in a leader and feel that the leader can make the right decision in a difficult situation.

Pair No.		
A	(28)	B
There are times when a leader shouldn't make decisions for those under him. The leader has the power to decide things, but each man has certain rights also.		A leader should give those under him some opportunity to make decisions, when possible. At times the leader is not the best judge of a situation and should be willing to accept what others say.
A	(29)	B
Some leaders are good, others are quite poor. Good leaders are those who know what is right for the men under them. These leaders deserve the respect of every man.		Leaders cannot be judged easily. Many things go to make up good leadership. Most people fall short in some way or another, but that is to be expected.

Pair No.		
A	(30)	B
Leaders are needed more at certain times than at others. Even though people can work out many of their own problems, a leader can sometimes give valuable advice.		Some people need leaders to make their decisions. I prefer to be an individual and decide for myself, when possible. Most leaders won't let you do this.

6. Imagine that someone has found fault with you. Choose the response from each pair that comes closest to your feelings about such a situation. Indicate your choice by circling either "A" or "B".

When other people find fault with me . . .

Pair No.		
A	(31)	B
It means that someone dislikes something I'm doing. People who find fault with others are not always correct. Each person has his own ideas about what's right.		It means that someone has noticed something and feels he must speak out. It may be that we don't agree about a certain thing. Although we both have our own ideas, we can talk about it.

Pair No.		
A	(32)	B
I first wonder if they are serious and why they have found fault with me. I then try to consider what they've said and make changes if it will help.		If enough people point out the same fault, there must be something to it. I try to rid myself of the fault, especially, if the criticizers are people "in-the-know."
A	(33)	B
They have noticed something about me of which I am not aware. Although criticism may be hard to take, it is often helpful.		They are telling me something they feel is correct. Often they may have a good point which can help me in my own thinking. At least it's worthwhile to consider it.
A	(34)	B
I may accept what is said or I may not. It depends upon who is pointing out the fault. Sometimes best to just stay out of sight.		I accept what is said if it is worthwhile, but sometimes I don't feel like changing anything. I usually question the person.

PAIR NO.		
A	(35)	B
I like to find out what it means; since people are different from one another, it could mean almost anything. A few people just like to find fault with others but there's usually something to be learned.		There is something to be changed. Either I am doing something wrong or else they don't like what I'm doing. Whoever is at fault should be informed so that the situation can be set straight.
A	(36)	B
I don't mind if their remarks are meant to be helpful, but there are too many people who find fault just to give you a hard time.		It often means that they're trying to be disagreeable. People get this way when they've had a bad day. I try to examine their remarks in terms of what's behind them.

CHECK AND MAKE SURE THAT YOU'VE CHOSEN ONE MEMBER OF EACH PAIR

(A TOTAL OF 36 CIRCLES)

INDIVIDUAL TOPICAL INVENTORY SCORING KEY

Pair No.	SYSTEM A	SYSTEM B	Pair No.	SYSTEM A	SYSTEM B
1.	3	2	19.	3	4
2.	1	4	20.	4	2
3.	3	1	21.	2	1
4.	2	1	22.	1	4
5.	4	3	23.	3	2
6.	2	4	24.	1	3
7.	1	3	25.	2	1
8.	2	1	26.	4	3
9.	3	4	27.	3	1
10.	2	3	28.	2	4
11.	4	1	29.	1	4
12.	2	4	30.	3	2
13.	4	2	31.	2	4
14.	1	3	32.	3	1
15.	3	2	33.	3	4
16.	3	4	34.	1	2
17.	1	2	35.	2	3
18.	4	1	36.	2	3

NORMS FOR INDIVIDUAL TOPICAL INVENTORY

(Obtained from 461 Naval Trainees - Tuckman)

DECILE	SYSTEMS			
	I	II	III	IV
10	13+	12+	12+	13+
9	12	11	11	12
8	11	10	10	11
7	10-11	9	9-10	10-11
6	9-	8-	8-	9-

SYSTEM SCORING:

If S scores 9th or 10th Decile in one system and 8th or lower in all others, classify him in his highest system. If necessary, S's who score 8th Decile in one system and 6th or lower in all others may also be classified in highest scoring system.

i. Simple Message

The throttle was wide open. I was flying towards the coast. A lot had happened in a single minute. I did not fly out to sea. The wind forced me out of the valley like a monsterous cough. It was like being shot out of a cannon. Instantly I turned towards the coast line. I noticed that I was five miles from the coast. The coast was a mere blur. The mountains looked like a fortress standing in front of the pure sky. The cyclone was crushing me down to the water. I didn't know how fast the wind was blowing. I tried to climb. I found out that trying to climb was a disasterous mistake. The fastest my plane would go was 150 m.p.h. I was flying as fast as I could. I was only 60 feet above the water. I was unable to budge the plane. The wind was blowing very hard.

I was facing the coast. The plane was using all the power it had. The wind from the shore was shooting through gaps in the mountain range. I felt like a person on the end of a huge whip which was cracking over the sea.

I had to struggle against the wind blowing from the east coast. The wind was also blowing down from the mountains. I was afraid of hitting the sea. The wind was blowing so hard it could knock me down into the water. The wind was turning me like an acrobat. Whenever I was turned I was afraid that I wouldn't be able to straighten out the plane. I could run out of gas. If I ran out of gas I would hit the water and drown.

I hung on to the controls of my heavy transport plane. My attention was on the physical struggle. I could only think of very simple ideas. I couldn't feel a thing. I looked at the sea. I saw what the wind was doing to the sea. The sea was white and green. Every once in a while the water was clear. When the water was clear I saw a green and black sea bottom. This glass of sea would shatter.

I had been struggling for twenty minutes. It was hopeless. I had not moved a hundred yards. The wind was blowing so hard five miles from shore I could hardly fly. The wind was blowing harder near shore so I probably couldn't even fly there.

The only thing I thought about was to straighten out. I must straighten out.

ii. Complex Message

There I was, throttle wide open, facing the coast, at right angles to the coast and facing it. A lot had happened in a single minute. In the first place I had not flown out to sea. I had been spat out to sea by a monsterous cough, vomited out of my valley as from a cannon. When, what seemed to me instantly, I turned in order to put myself where I wanted to be in respect of the coastline, I saw that the coast line was a blur; and I was five miles out to sea. The mountain range stood up like a fortress against the pure sky while the cyclone crushed me down to the surface of the waters. How hard that wind was blowing I found out as soon as I tried to climb, I became conscious of my disasterous mistake: throttle wide open, engines running at my maximum, which was 150 m.p.h., my plane hanging 60 feet over the water, I was unable to budge.

Hanging on with all the power in my engines, face to the coast, face to that wind where each gap in the teeth of the range sent forth a stream of air, I felt as if I were clinging to the tip of a monsterous whip that was cracking over the sea.

I was struggling not merely against the whirling winds that blew off the east-coast range, but likely also against a whole sky blown down upon me off the mountains. I was fearful of bumping the sea because of the helplessly acrobatic positions in which the wind was turning me. Each time that I was turned I became afraid that I might be un able to straighten out. Besides there was a chance I would find myself out of gas and simply drown.

I hung on meanwhile to the controls of my heavy transport plane, my attention monopolized by the physical struggle and my mind occupied by the very simplest thoughts. I was feeling practically nothing as I stared down at the imprint the wind, blowing at 150 m.p.h., had on the sea. The sea was white and it was green, and now and then the water went clear between the white pools, and I could see a green and black sea bottom, and then the great glass of sea would be shattered again.

It seemed hopeless; in twenty minutes of struggle I had not moved 100 yards. What was more, with blowing as hard as it was five miles from the coast, I wondered how I could possibly withstand the winds along the shore, assuming I was able to get in. Fear however was out of the question. I was emptied of everything except the vision of a very simple act. I must straighten out. Straighten out.

APPENDIX C - QUESTIONAIRE

NAME:.....

1) How unpleasant did you find the experiment?

very unpleasant 1 2 3 4 5 6 7 very pleasant

2) Were the messages interesting?

very interesting 1 2 3 4 5 6 7 very uninteresting

3) Were the messages easy to understand?

very difficult 1 2 3 4 5 6 7 very easy

4) Did you find any difference between the message on the left side and the one on the right? If yes, please list the differences.

5) What other things did you think about or do during the experiment? List them.

6) Did you feel a need for stimulation during the experiment?

strong need 1 2 3 4 5 6 7 no need at all

7) What did you think the purpose of the experiment was?

ZUTU

Instructions:

There are two switches present in the experimental room. When either switch is pressed a recorded message will be played into the room. Whenever you wish to hear either message press the switch until the message begins to be played. You may only hear one message at a time.

The experiment is worth four experimenter credits and will last four hours. It is most important that you make an effort to stay the entire four hours. Otherwise the data collected is worthless. If, however, you feel you cannot stand the experiment press either switch four or five times and you will be released.

It is also important that you do not remove any of the apparatus. If you do important data will not be collected.

If you feel you may need to use the washroom within the next four hours, there is a washroom to the right of the elevator.

'Electrodes' will be attached to your chest. These are completely safe and harmless and are used to collect physiological measurements.

		C_1								C_2							
	Ss	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8
	1	3	3	0	2	2	1	1	1	3	3	1	0	1	2	0	1
	2	0	3	6	5	3	1	1	1	7	6	3	1	5	5	3	5
	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4	4	2	1	2	4	1	1	2	4	1	3	4	3	0	1	1
A_1 B_1	5	2	1	3	1	0	2	4	1	3	3	2	3	1	3	4	2
	6	3	5	3	0	0	0	0	0	5	3	0	1	0	0	0	0
	7	6	3	2	4	2	3	3	1	3	4	3	2	5	3	3	9
	8	3	0	1	2	0	0	1	0	3	2	2	1	0	1	0	0
	9	1	0	0	0	0	1	0	0	1	0	0	1	0	1	0	0
	10	2	1	2	1	0	0	2	0	2	2	2	1	0	2	2	1

A_1 = concrete, A_2 = abstract; B_1 = SD, B_2 = Non-SD; C_1 = complex message, C_2 = simple message; D_1 .... D_8 = 1/2 hour periods.

						C_1						C_1					
	Ss	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8
	1	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0
	2	1	2	2	0	0	0	0	0	2	2	3	1	0	0	0	0
	3	1	1	0	0	1	0	0	0	1	0	0	0	1	0	0	0
	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5	1	0	0	0	1	0	0	0	1	1	1	0	0	0	0	0
A_1 B_2	6	1	0	0	1	1	1	1	0	1	0	0	1	1	0	1	0
	7	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	8	2	2	2	1	1	1	1	1	3	2	1	0	0	0	1	0
	9	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	10	4	2	4	1	2	1	0	0	4	4	2	1	1	0	0	0

A_1 = concrete, A_2 = abstract; B_1 = SD, B_2 = Non-SD; C_1 = complex message, C_2 = simple message; D_1 ... D_8 = 1/2 hour periods.

		C_1								C_2							
	Ss	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8
	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	3	2	0	1	0	0	2	0	1	2	0	1	0	1	0	0	0
	4	2	0	1	0	0	0	0	0	1	1	1	0	1	0	0	0
A_2 B_1	5	2	2	1	2	2	0	1	0	2	1	2	0	0	1	1	0
	6	0	3	1	0	0	0	0	0	0	1	0	0	1	0	0	0
	7	2	4	1	2	3	3	0	3	3	0	1	2	2	2	0	2
	8	4	2	0	0	1	2	1	0	4	1	0	1	2	1	0	0
	9	1	0	0	0	1	1	1	1	1	0	0	0	1	1	0	0
	10	5	3	2	4	3	2	3	2	2	2	3	2	0	0	0	0

A_1 = concrete, A_2 = abstract; B_1 = SD, B_2 = Non-SD; C_1 = complex message, C_2 = simple message; D_1 ....D_8 = 1/2 hour periods.

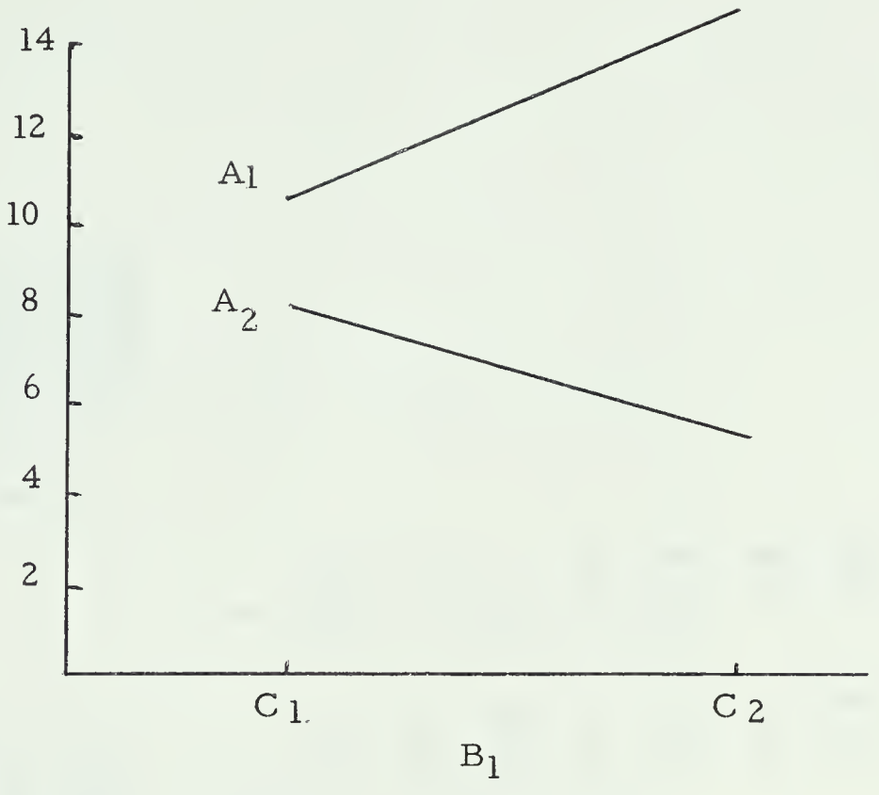
		C_1								C_2							
	Ss	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8
	1	3	2	0	0	1	0	0	0	3	0	0	0	0	0	0	0
	2	1	2	0	1	1	1	0	0	1	1	0	1	0	0	1	1
	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$A_2 B_2$	5	2	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
	6	2	0	0	0	0	0	2	4	2	2	5	1	2	0	2	0
	7	2	1	0	0	1	0	0	1	2	0	0	1	0	0	1	1
	8	2	1	0	1	0	1	0	1	2	0	1	1	0	0	1	0
	9	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0
	10	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0

A_1 = concrete, A_2 = abstract; B_1 = SD, B_2 = Non-SD; C_1 = complex message, C_2 = simple message; D_1 ..... D_8 - 1/2 hour periods.

ANALYSIS OF VARIANCE FOR TOTAL NUMBER OF REQUESTS

Source of Var.	SS	Dif.	MS	F	P
*A	31.95	1	31.95	3.472	$<.10$
B	87.76	1	87.76	9.64	$<.01$
AXB	23.64	1	23.64	2.56	ns
S(ab)	332.07	36	9.2		
C	.01	1	.01	-	ns
D	103.20	7	14.74	16.94	$<.01$
CXD	.95	7	.13	-	ns
AXC	4.99	1	4.99	5.42	$<.01$
BXC	.13	7	.01	-	-
AXD	7.21	7	1.03	1.18	ns
BXD	2.05	7	.29	-	ns
AXCXD	7.08	7	1.01	1.46	ns
BXCXD	5.99	7	.855	1.23	ns
AXBXC	7.62	1	7.62	8.28	$<.01$
AXBXD	.58	7	.08	-	ns
AXBXCXD	4.98	7	.71	-	ns
SabXC	33.19	36	.92		
SabXD	220.28	252	.87		
SabXCXD	174.56	252	.69		

B_1 = SD, B_2 = Non SD, A_1 = concrete, A_2 = abstract, C_1 = complex message, C_2 = simple message, $D_1 \ldots D_8$ = 1/2 hour periods.



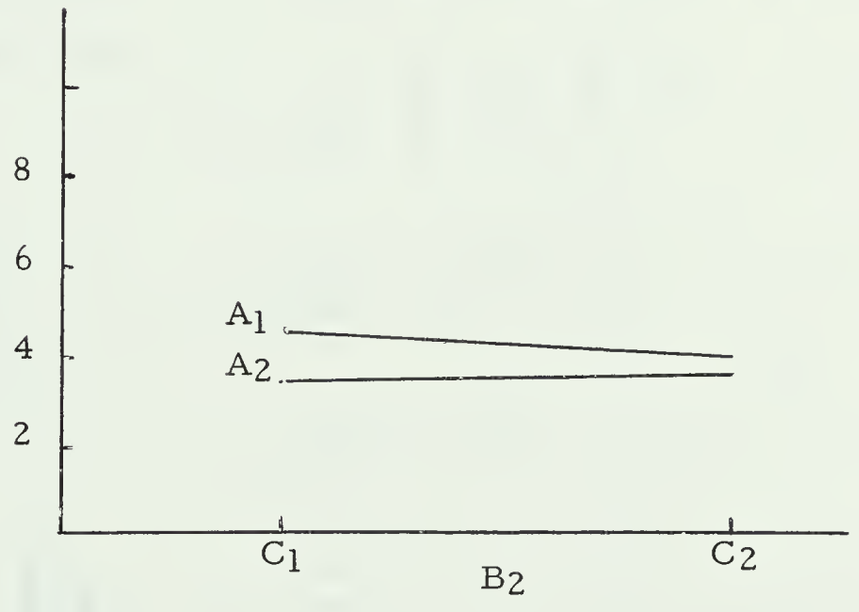


Figure I Conceptual complexity x Environmental complexity x Message complexity
Interaction A_1 = concrete, A_2 = abstract
B_1 = SD, B_2 = Non-SD, C_1 = complex message
C_1 = simple message

A_1 - concrete
A_2 - abstract
B_1 - SD
B_2 - Non-SD
C_1 - complex message
C_2 - simple message

Multiple Comparisons Using Duncan's Multiple Range Test

Mean		Mean	
8 =	$A_1 B_1 C_2$	4 =	$A_1 B_2 C_1$
7 =	$A_1 B_1 C_1$	3 =	$A_1 B_2 C_2$
6 =	$A_2 B_1 C_1$	2 =	$A_2 B_2 C_1$
5 =	$A_2 B_1 C_2$	1 =	$A_2 B_2 C_2$

		1	2	3	4	5	6	7	8
		3.7	3.8	3.9	4.6	5.1	8.1	11.6	14.9
1	3.7	.	.1	.2	.9	1.4	4.4	7.9	11.2
2	3.8		-	.1	.8	1.3	4.3	7.8	11.1
3	3.9		-	-	.7	1.2	4.2	7.7	11.0
4	4.6		-	-	-	.5	3.5	7.0	10.3
5	5.1		-	-	-	-	3.0	6.5	9.8
6	8.1		-	-	-	-	-	3.5	6.8
7	11.6		-	-	-	-	-	-	3.3
8	14.6		-	-	-	-	-	-	-

Duncan's Studentized Range

No. of Mean		Shortest Sig. Range		Shortest Sig. Range
2	2.772	.96	3.64	1.27
3	2.918	1.01	2.79	1.32
4	3.01	1.05	3.90	1.36
5	3.08	1.07	3.97	1.38
6	3.146	1.09	4.04	1.41
7	3.193	1.11	4.09	1.43
8	3.23	1.13	4.13	1.44

All means underlined by the same line are not

significantly different at the .05 level of significance

1	2	3	4	5	6	7	8
3.7	3.8	3.9	4.6	5.1	8.1	11.6	14.9

All means underlined by the same line are not

significantly different at the .01 level of significance

1	2	3	4	5	6	7	8
3.7	3.8	3.9	4.6	5.1	8.1	11.6	14.9

APPENDIX I

Analysis of Variance for Trend

Source of Var.	SS	df.	MS	F	P
Linear Components					
Overall Linear	77.56	1	77.56	98.17	$<.01$
A X B	3.7	1	3.7	4.69	$<.05$
A X B X C	4.80	1	4.80	6.20	$<.025$
B X C	1.18	1	1.18	-	ns
A	2.83	1	2.83	3.58	ns
B	.76	1	.76	-	ns
C	0	1	0	-	ns
A X C	3.01	1	3.01	3.82	ns
Quadratic Components					
Overall Quadratic	19.88	1	19.88	25.16	$<.01$
A X B	1.71	1	1.71	-	ns
A X B X C	4.41	1	4.41	5.58	$<.05$
B X C	1.51	1	1.51	-	ns
A	0	1	0	-	ns
B	.01	1	.01	-	ns
C	.08	1	.08	-	ns
A X C	4.73	1	4.73	5.98	$<.05$
Cubic Components					
Overall Cubic	4.34	1	4.34	5.49	$<.05$
A X B	.81	1	.81	-	ns
A X B X C	1.22	1	1.22	-	ns
B X C	.62	1	.62	-	ns
A	.33	1	.33	-	ns
B	2.95	1	2.95	3.73	ns
C	-1	1	-1	-	ns
A X C	.46	1	.46	-	ns
Pooled Error B	428.03	540	.79		

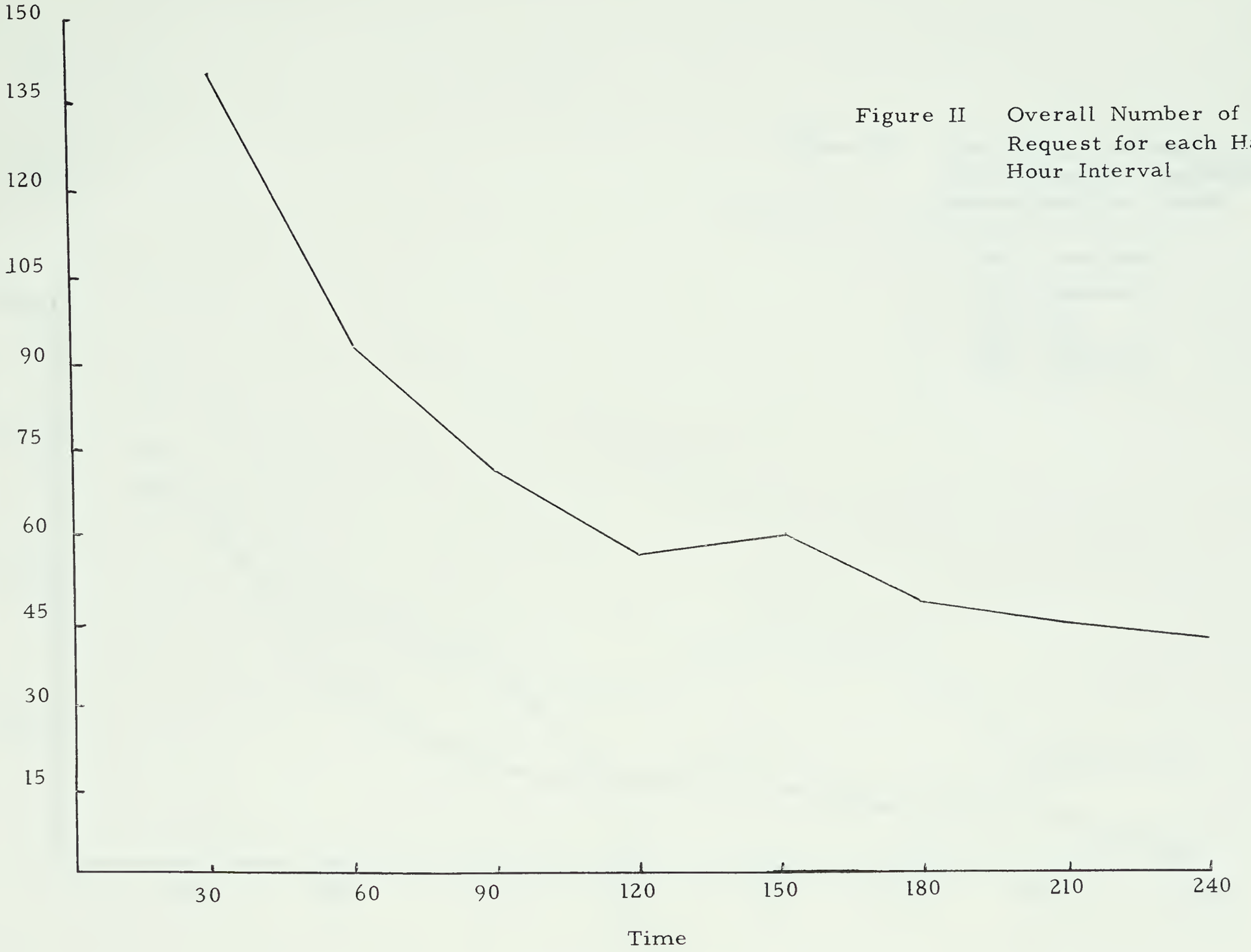
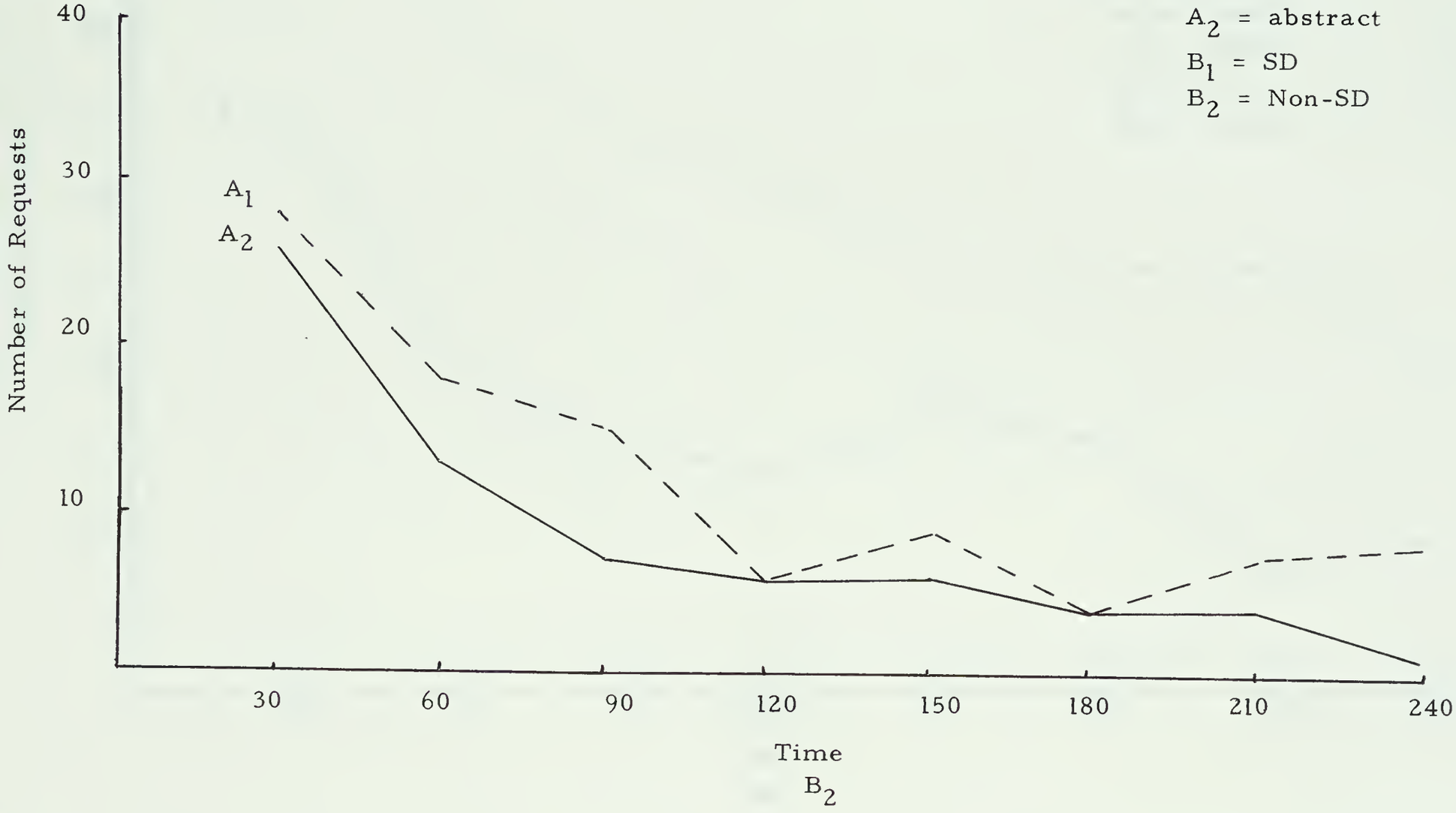


Figure II Overall Number of Request for each Half Hour Interval

Figure III Conceptual Complexity X Environmental Complexity Interaction For Trend.

A_1 = concrete
A_2 = abstract
B_1 = SD
B_2 = Non-SD



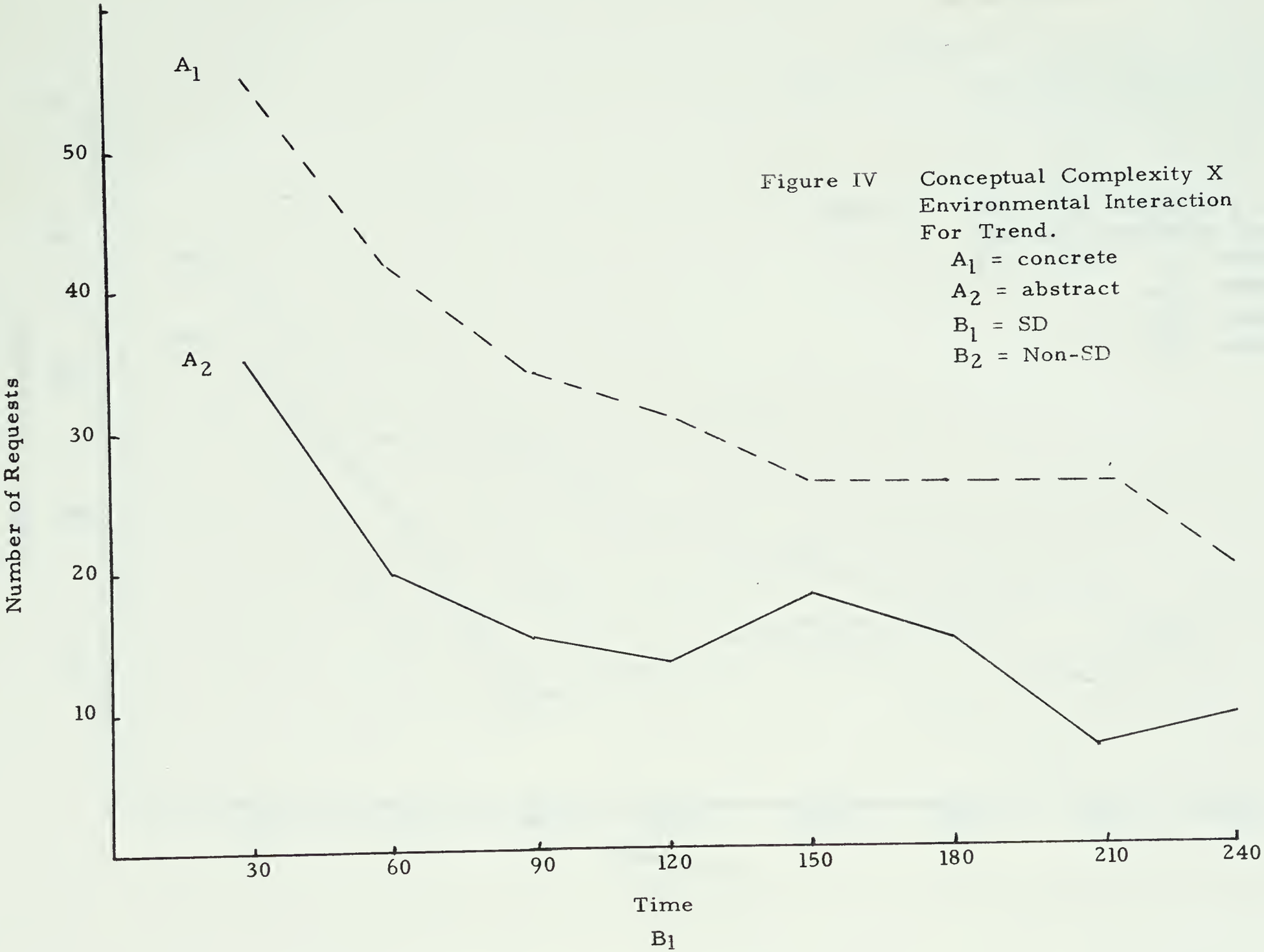


Figure IV Conceptual Complexity X Environmental Interaction For Trend.

A_1 = concrete

A_2 = abstract

B_1 = SD

B_2 = Non-SD

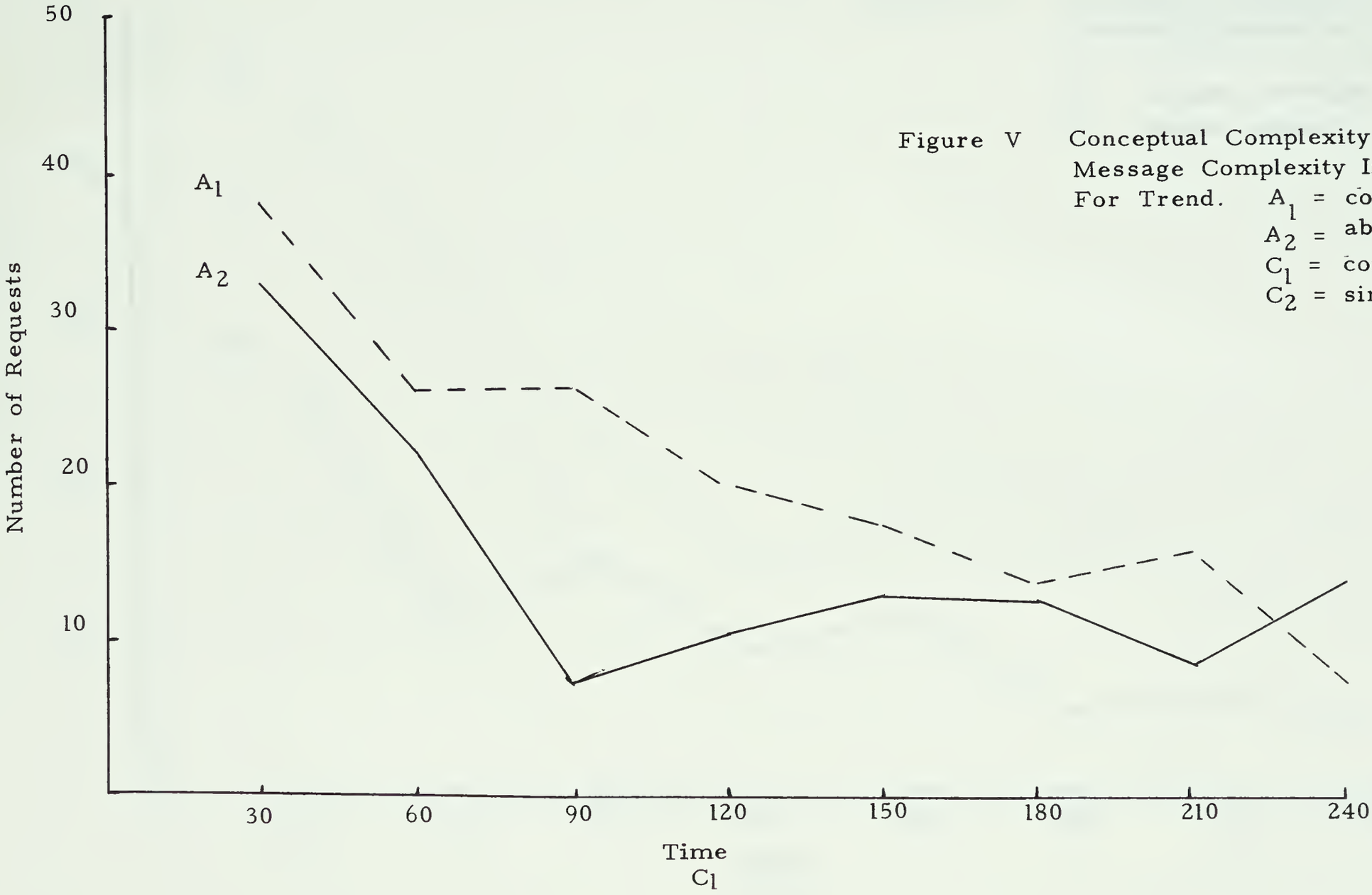


Figure V Conceptual Complexity X Message Complexity Interaction For Trend. A_1 = concrete, A_2 = abstract, C_1 = complex message, C_2 = simple message

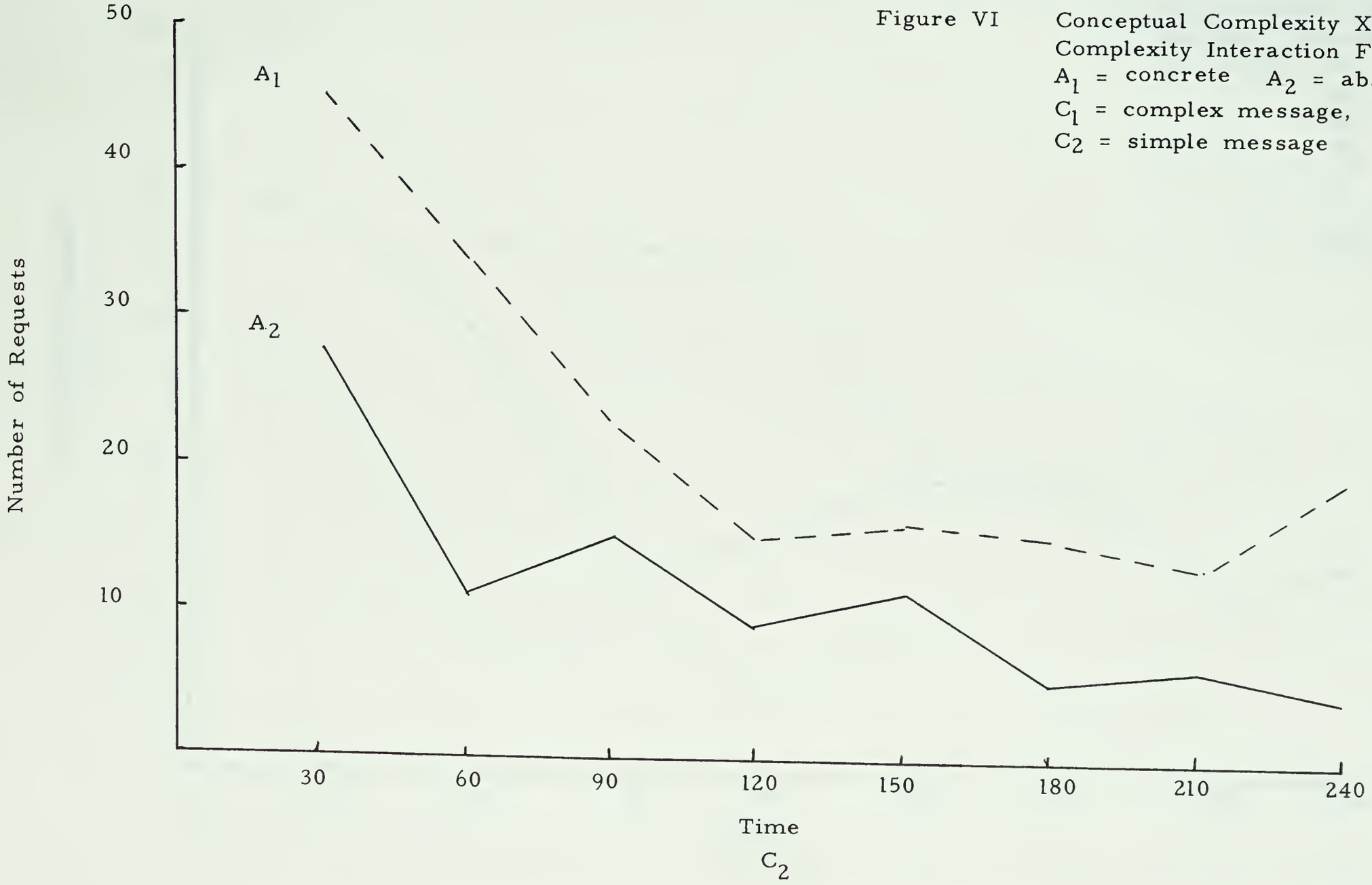
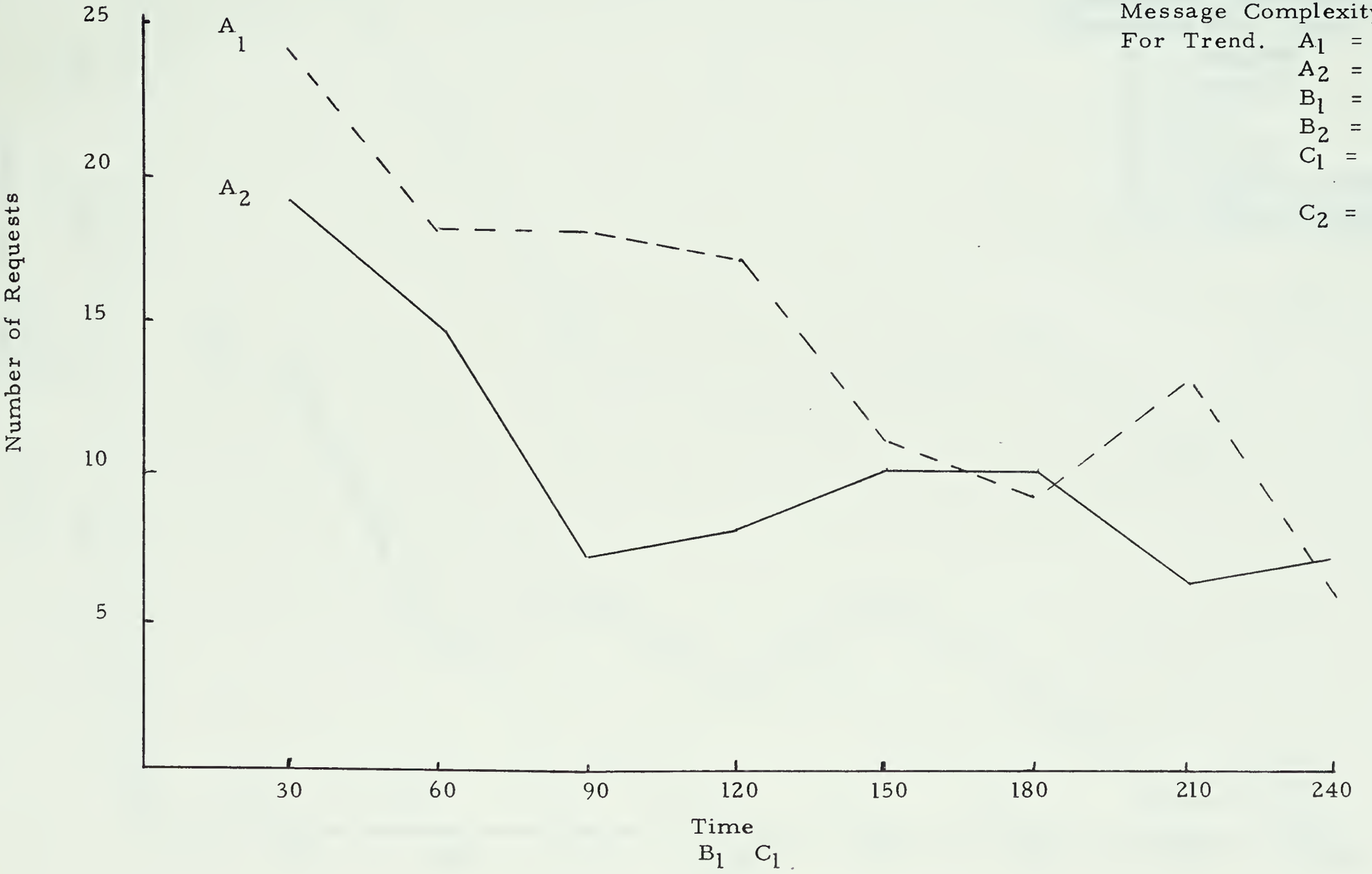


Figure VI Conceptual Complexity X Message Complexity Interaction For Trend.
A_1 = concrete A_2 = abstract
C_1 = complex message,
C_2 = simple message

Figure VII Conceptual Complexity X Environmental Complexity X Message Complexity Interaction For Trend. A_1 = concrete A_2 = abstract B_1 = SD B_2 = Non-SD C_1 = complex message C_2 = simple message



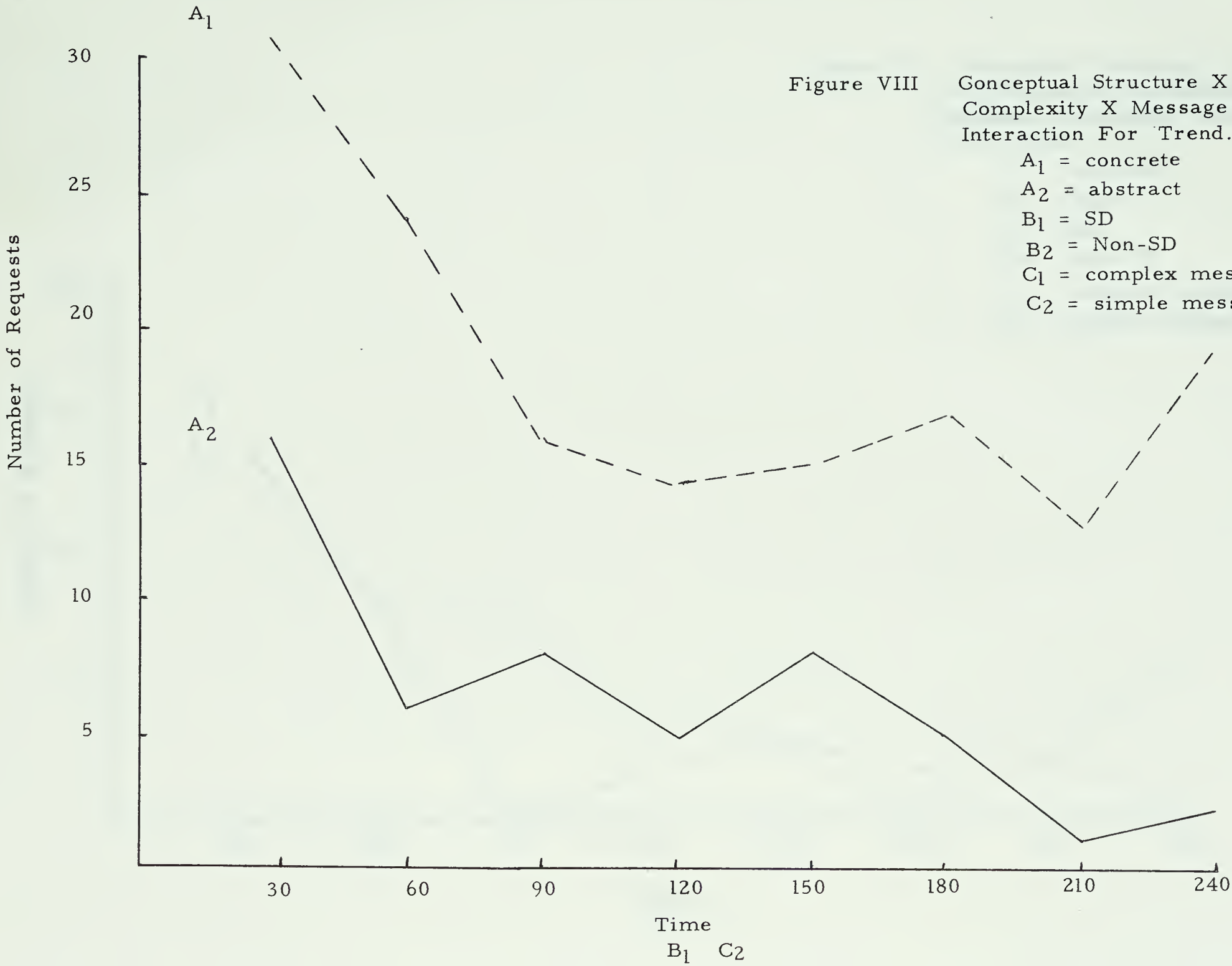


Figure VIII Conceptual Structure X Environmental Complexity X Message Complexity Interaction For Trend.

A_1 = concrete
A_2 = abstract
B_1 = SD
B_2 = Non-SD
C_1 = complex message
C_2 = simple message

Figure IX Conceptual Complexity X
Environmental Complexity X
Message Complexity Interaction
For Trend.

A_1 = concrete
A_2 = abstract
B_1 = SD
B_2 = Non-SD
C_1 = complex message
C_2 = simple message

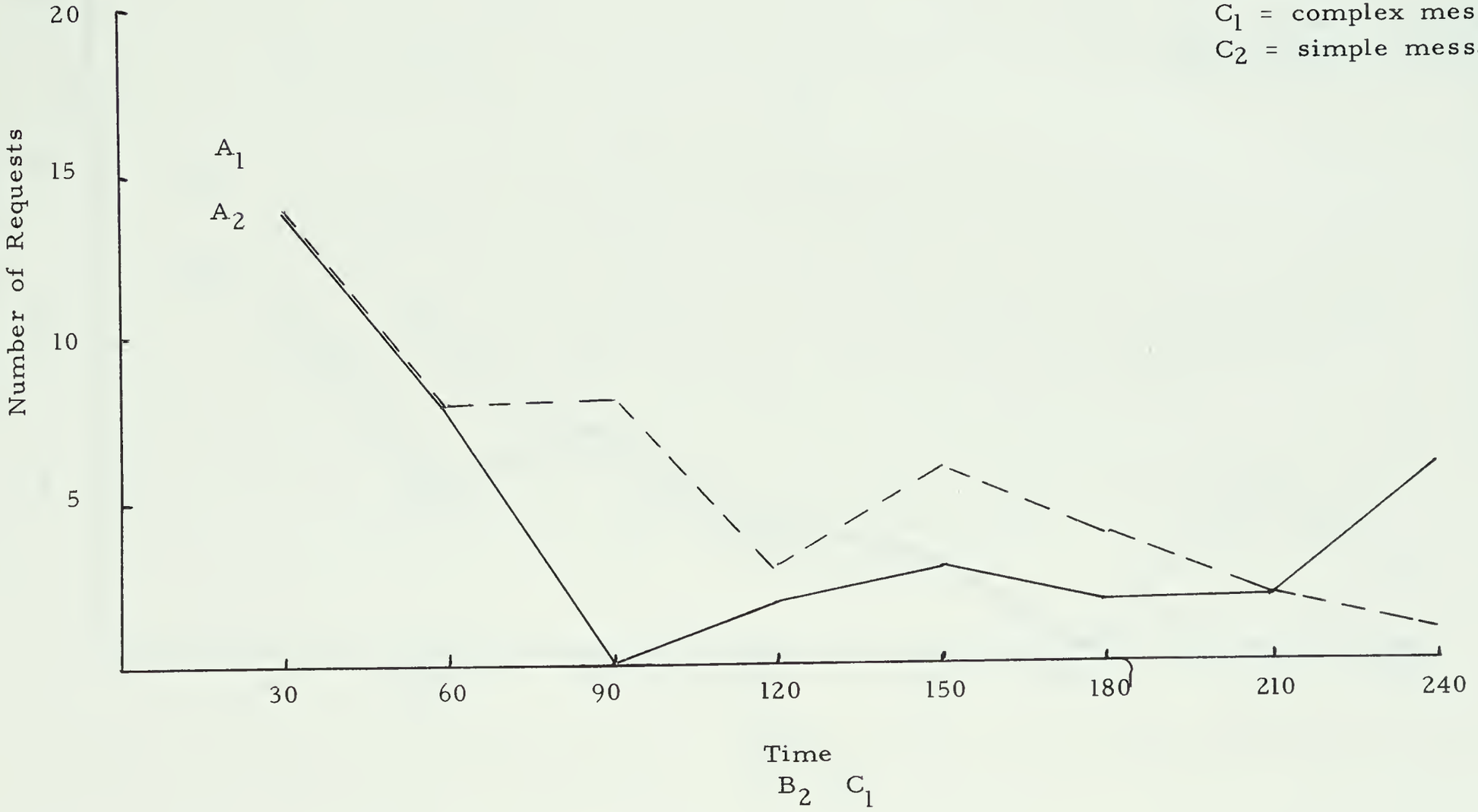
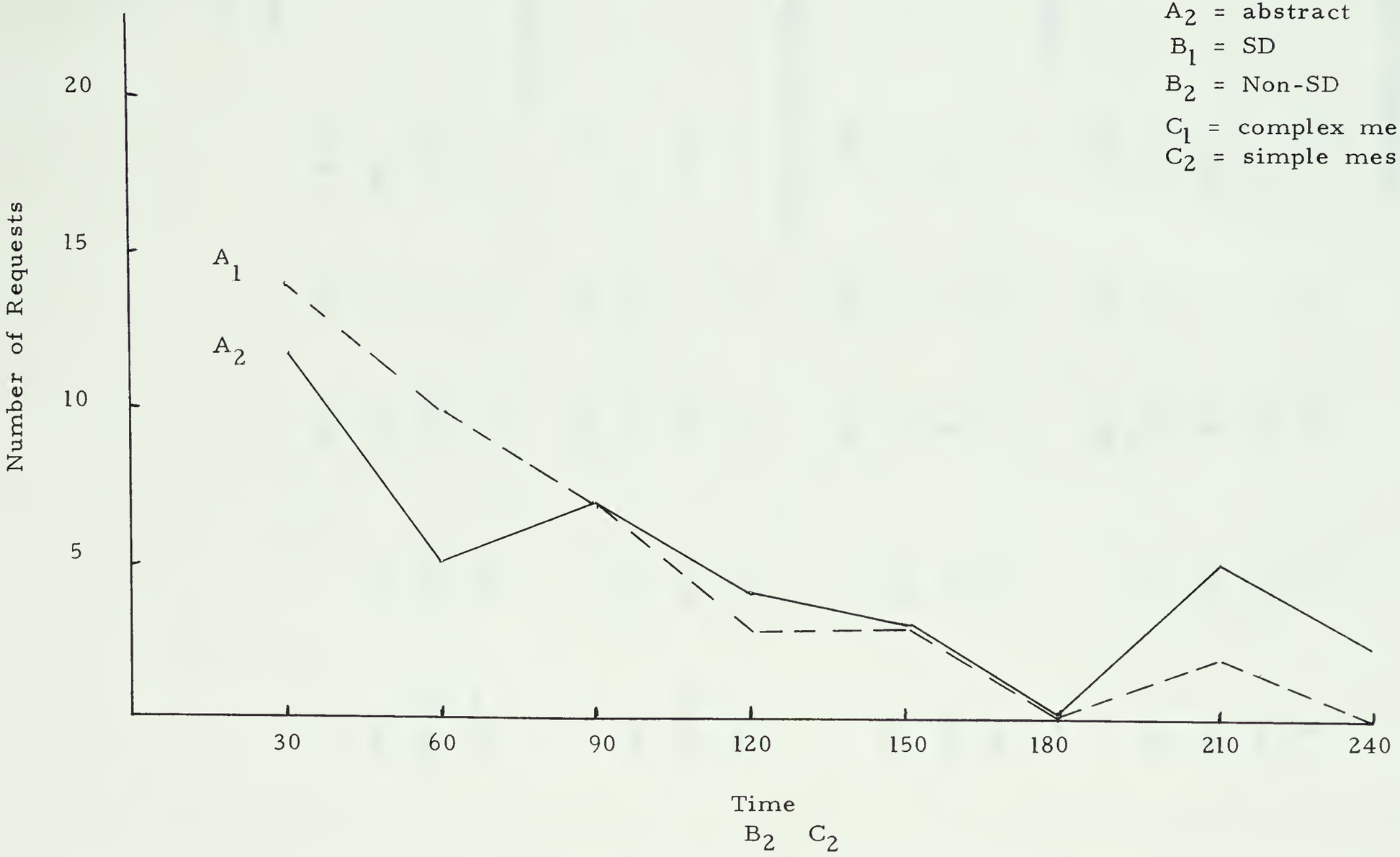


Figure X Conceptual Complexity X Environmental Complexity X Message Complexity Interaction For Trend.

A_1 = concrete
A_2 = abstract
B_1 = SD
B_2 = Non-SD
C_1 = complex message
C_2 = simple message



APPENDIX K

Analyses of Variance for Questionnaire

Pleasantness of Experiment

Source Of Var.	SS	df	MS	f	p
A	.9	1	.9	.45	ns
B	1.6	1	1.6	.80	ns
AXB	0	1	0	-	ns
Within	71.4	36	1.98		

Message Interest

A	4	1	4	1.43	ns
B	1.6	1	1.6	.57	ns
AXB	3.4	1	3.4	1.21	ns
Within	100.6	36	2.79		

Ease of Message Understanding

A	4	1	.4	.18	ns
B	16.4	1	16.4	7.48	$<.01$
AXB	.6	1	.6	.27	ns
Within	79	36	2.19		

Need for Stimulation

A	2.5	1	2.5	5.43	$<.05$
B	12.1	1	12.1	26.30	$<.001$
AXB	.40	1	.40	.54	ns
Within	16.6	36	.46		

A_1 = concrete

A_2 = abstract

B_1 = SD

B_2 = Non-SD

BIBLIOGRAPHY

Berlyne, D. E. Conflict, arousal and curiosity. New York: McGraw-Hill, 1960.

Easterbrook, J.A. The effect of emotion on cue utilization and the organization of behavior. Psychol. Rev., 1959, 66 (3), 183-201.

Fiske, D.W., & Maddi, S.R. (Eds.) Functions of varied experience. Homewood, Ill.: Dorsey Press, 1961.

Goldstein, K. Stimulus reinforcement during sensory deprivation. Perceptual and Motor Skills, 1965, 20, 757-762.

Harvey, O.J., Hunt, D.E., & Schroder, H.M. Conceptual systems and personality organization. New York: John Wiley, 1961.

Hewitt, D. Self Concept change as a function of cognitive complexity and reduced environmental stimulation. Unpublished Master Thesis, University of Alberta, 1966.

Hewitt, D., & Rule, Brendan. Conceptual structure and deprivation effects on self concept change. Sociometry, 1968, (In press.)

Jones, A. Information deprivation in humans. In progress in experimental personality research. New York: Academic Press, 1966, 3, 241-307.

Karlins, M., & Lamm, H. Information search as a function of conceptual structure in a complex problem-solving task. J. Personality and Soc. Psychol., 1967, 5, 459-463.

Karlins, M., Coffman, T., Lamm, H., & Schroder, H. The effect of conceptual complexity of information search in a complex problem-solving task. Psychon. Sci., 1967, 7, 137-138.

Malmo, R. Activation: a neurophysiological dimension. Psychol. Rev., 1959, 66(6), 367-386.

Miller, J.G. Information input overload and psychopathology. Amer. J. Psychiat., 1960, 116(8), 695-704.

Myers, T., Murphy, D., Smith, S., & Goffard, S. Experimental studies of sensory deprivation and social isolation. Alexandria, Va: Human Resources Research Office, June, 1966, Tech. Rep.) 66-68.

Rossi, A.M., & Solomon, P. Button-pressing for a time-off reward during sensory deprivation: I. Relation to activity reward; II. Relation to descriptions of experience. Percept. mot. Skills, 1964, 18, 211-216. (a).

Rossi, A.M., & Solomon, P. Button-pressing for a time-off reward during sensory deprivation: III. Effects of varied time-off rewards. Percept. mot. Skills, 1964, 18, 794-796. (b).

Rossi, A.M., & Solomon, P. Button-pressing for a time-off reward during sensory deprivation: IV. Relation to change in ratings of well-being. Percept. mot. Skills, 1964, 19, 520-522. (c).

Rossi, A.M., & Solomon, P. Button-pressing for a time-off reward during sensory deprivation: V. Effects of relatively comfortable and uncomfortable sessions. Percept. mot. Skills, 1964, 19, 803-807. (d).

Schroder, H., Driver, M., & Streufert, S. Human Information Processing, Holt, Rinehart, and Winston, Inc. Toronto, 1967.

Schultz, D. Sensory Restriction. Academic Press, New York, 1965.

Sieber, Joan E., & Lanzetta, J. T. Conflict and conceptual structure as determinants of decision-making behavior. J. Pers., 1964, 32(4), 622-641.

Smith, S., & Myers, T. Stimulation seeking during sensory deprivation. Perceptual and Motor Skills, 1966 23, 1151-1163.

Streufert, S., Clardy, M., Driver, M. J., Karlins, M., Schroder, H. M., & Suedfeld, P. A tactical game for the analysis of complex decision making in individuals and groups. Psychol. Reports, 1965, 17, 723-729.

Streufert, S., & Driver, M. J. Conceptual structure, information load and perceptual complexity. Psychonomic Sci., 1966, 3, 249-250.

Streufert, S., Driver, M., & Haun, K. Components of Response rate in complex decision-making. J. of Exp. Soc. Psychol., 1967, 3, 286-295.

Streufert, S., & Schroder, H. M. Conceptual structure, environmental complexity and task performance. J. exp. Res. Person., 1965, 1, 132-137.

Streufert, S., Suedfeld, P., & Driver, M. J. Conceptual structure, information search, and information utilization. J. Pers. soc. Psychol., 1965, 2, 736-746.

Suedfeld, P. Attitude manipulation in restricted environments. I. Conceptual structure and response to propaganda. J. of Abnormal and Social Psychology, 1964, 68, 242-247. (a)

Suedfeld, P. Conceptual structure and subjective stress in sensory deprivation. Perceptual and Motor Skills, 1964, 19, 896-898, b.

Suedfeld, P. Information processing: the effects of differential pattern complexity and input rate. Psychon. Sci., 1966, 6, 249.

Suedfeld, P. & Hagen, R. Measurement of information complexity: I. conceptual structure and information pattern as factors in information processing. J. Pers. soc. Psychol., 1966, 4, 233-236.

Suedfeld, P. & Vernon, J. Attitude manipulation in restricted environments: II conceptual structure and the internalization of propaganda received as a reward for compliance. J. Pers. soc. Psychol., 1966, 586-589.

Tuckman, B. Personality structure, group composition and group functioning. Sociometry, 1964, 27, 469-487.

Tuckman, B. Integrative complexity: its measurement and relation to creativity. Educational and Psychological Measurement, 1966, 26, 369-382.

Tuckman, B. Group composition and group performance of structured and unstructured tasks. J. exp. Soc. Psychol., 1967, 3, 25-40